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PREFACE

The twenty-first volume of the *Annual Review of Sociology* represents, we think, a discipline that has reached maturity. Bold in its ambitions, this volume reflects the breadth and diversity of the discipline with contributions that range from the sociological study of scientific knowledge to the analysis of world systems, from new methods for the study of sequences to dynamic models of organizational change, from a discussion of the unauthorized margins of illegal immigration to a treatment of the uncertain implications of the Easterlin effect. Additional insightful chapters cover wide-ranging economic, class, and stratification issues that have become the heart of sociological analysis in a world of increasing inequality.

Interesting times and topics make for fascinating careers, and this volume of the *Review* opens and closes with accounts of two of the discipline's most remarkable scholarly careers. In our prefatory chapter, Peter Blau tells the extraordinary story of his journey from war-torn Europe to America and his experiences in several of America's finest educational institutions, including unique formative periods in the sociology departments at Columbia University and the University of Chicago. Blau provides an exciting account of the role these experiences played in his development (which still continues) of macrostructural theory and research.

The volume closes with Linda Bourque's biographical essay about her friend and colleague Judith Blake, who like Blau was a product of the graduate program at Columbia. Blake then headed west to a career at Berkeley and UCLA, where she played a vital role in expanding the contributions of survey methodology to the development of demographic theory and research. An earlier volume was dedicated to the memory of Judith Blake and her service as Editor of the *Review*. Bourque's essay tells a lively story of Blake's scholarly work and of the many students, friends and colleagues who benefited from her advice and support.

This year marks the arrival on our Editorial Committee of Walter (more widely known as Woody) Powell, fresh from his innovative work as Editor of *Contemporary Sociology*. Woody is renowned for his eclectic interests and wide networks, and we plan to draw on both of these extensively. We express our gratitude to Rachel Rosenfeld and Paul Di Maggio for their tours of service on the Committee; however, we have grown far too dependent on their good will, talent, and energy to let the formal end of their terms excuse them from continuing contributions. We also acknowledge with appreciation the welcome continuing reactions, comments, and suggestions from readers of the *Review*.

The Editors

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Peter M Blau

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A CIRCUITOUS PATH TO MACROSTRUCTURAL THEORY

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ABSTRACT

I introduce this memoir about my academic career by describing the fortuitous incidents involved in my coming to this country and becoming a sociologist. In graduate school my sociological orientation changed under the influence of Merton and Lazarsfeld from grand theories to systematic theory grounded in research. My dissertation was a field study of bureaucracy in terms of Weber's theory, which led to a book on exchange theory. Next I collaborated with Duncan on a nationwide study of occupational achievement and mobility, for which I learned regression analysis, reluctantly at first, but later becoming converted to it. During the next decade I conducted a research program on bureaucracy, specifically of quantitative studies of various types of formal organizations, from which I developed a limited organizational theory. The limitations of this theory prompted me to construct a formal macrostructural theory of population structure's influences on intergroup relations, which was subsequently tested in empirical research on the 125 largest metropolitan areas in the United States.

INTRODUCTION

My becoming a sociologist was doubly fortuitous. To go to college and then to graduate school was for me the result of a combination of incredible coincidences, and my majoring in sociology was an accident, since when I started college I did not know what sociology was.

In November 1939, I arrived in New York as an immigrant from Vienna, though not by a direct route. After the Nazis had taken over Austria in 1938,

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I fled to Prague, where I spent a year, during which the Nazis also invaded Czechoslovakia. When I finally received my American visa in August 1939 and traveled to France to embark for the United States, World War II broke out and the ship on which my passage was booked did not sail. Thousands of people—Americans returning home as well as refugees immigrating—waited in Le Havre for passage, and this turned out to be fortunate for me. While waiting in Le Havre for news about sailing, I met and passed the time with some Americans, one of whom was the graduate of a midwestern protestant college. He told me that students at his college had collected a fund for a refugee scholarship, but for this scholarship they had no candidate. He asked me whether I would be interested. I could not believe my ears, and I did not believe him, honest as he seemed (and was), but I told him I would be very interested.

Then I was interned as an enemy alien for a couple of months in France, owing to my German passport. Before I was taken to the internment camp, the American gentleman volunteered to take most of my baggage to New York and leave it there with a friend, where I could pick it up once I arrived. When the French authorities approved my petition to let me embark for New York (another piece of good luck) and had a soldier escort me to a ship leaving for New York, I finally sailed. On arriving, I called the number of my friend's friend to inquire about my baggage and about the possibility of the scholarship ("possibility" because I hardly believed it would materialize). This man told me that I was (again) lucky because the young faculty adviser of the scholarship committee happened to be in New York for a conference and I could meet him. I did meet him (and got my baggage), and after consulting with the committee he wrote and offered me the scholarship. (Paul Lehmann—for that is who he was—later became a well-known theologian at Princeton, Harvard, and Union Theological Seminary. Paul and his wife remained my best and oldest friends until his recent death.)

I accepted the offer, of course, and went to Elmhurst College, near Chicago. I wanted to major in psychology, having been inspired about the subject by my gymnasium teacher, Fritz Redl, but the college had no regular psychology department and I was advised instead to major in sociology. I did not know what sociology was, but after exploring it I found it interesting and did major in it. In good part, my interest was the result of an excellent sociology teacher, Fritz Henssler, also an immigrant. Henssler had a law doctorate from Germany but only an MA in sociology from Northwestern (undoubtedly the reason that he could not get an appointment in a university).

My major sociological interest was in theory, but my conception of theory then was very different from what it is now, having changed several times in the five decades since. In college, I admired broad theoretical systems that provide sweeping interpretations of people and social life, theories such as those of Marx, Freud, George Herbert Mead, Cooley, Thomas, and some neo-Freudians, notably Fromm (1941), whose *Escape from Freedom* had just appeared.

My theoretical conception then differed from mine today in another dimension as well. Despite my interest in Marxian theory, my theoretical orientation was not at all structural but was sociopsychological. I considered value orientations that motivate people essential for interpreting social life, and I was critical of approaches, such as demographic studies or Watson's behaviorism, that confined themselves to objective conditions. Both aspects of my theoretical orientation are reflected in my bachelor's thesis. Numerous books and articles published around 1940 studied relations between Marx's and Freud's theories; this gave me the idea of analyzing for my AB thesis the relationship of the theories of Mead and Freud.

GRAND THEORETICAL SCHEMES AND RESEARCH-GROUNDED THEORIES

After graduating from college in 1942, I joined the army, where I spent three years, half of it in combat in Europe. Although I wanted to get an advanced degree in sociology, I had not thought I would be able to afford graduate school, but the GI Bill, providing tuition and a small living allowance to veterans, made it possible. A couple of months after my discharge I entered the sociology department at Columbia University, in February 1946. I was primarily attracted there by Robert Lynd, whose books I had read in college, and with whose progressive ideology I had great sympathy. I took courses and seminars of his and enjoyed my conferences with him, but my academic interests gradually changed in new directions.

At first I continued to pursue my major interest in grand social theory, and initially I disparaged survey research as mere fact finding. I took virtually all theory courses from Abel, MacIver, and Merton, and my reading concentrated on the classical theories. I read nearly all the major works (translated or in German) by Weber, Durkheim, Pareto, and Simmel as well as American theorists, including the first book of the man who would dominate theoretical sociology for some decades, Parsons' *The Structure of Social Action* (1937).[1] However, I also took most of Lazarsfeld's methodology courses, not only the required ones, because I was increasingly interested in research and in the sophisticated procedures Lazarsfeld had developed for analyzing empirical data.

---

[1] Although I no longer consider the complex conceptual frameworks that characterize Parsons' monographs proper social science theories, I do admire the systematic and insightful distinctions his theoretical schemes make, and I consider such conceptual schemes, and specifically his, to make important contributions to the development of theories. Indeed, Parsons (1951: 536) himself notes in the concluding chapter of *The Social System* that the theoretical analysis presented "is not an attempt to formulate a theory of any particular concrete phenomenon, but is the attempt to present a logically articulated conceptual scheme."

The sociology department of Columbia University at midcentury was an exciting place to be. The intellectual academic atmosphere that permeated it engendered the feeling in many of us that we were on the verge of new developments and advances in sociology. This atmosphere had its source in a challenging faculty and an exceptionally large student body with disproportionate numbers of very bright students.[2] Many of them had been held back by the war and were now eager to make up for lost time by learning quickly and starting to make contributions of their own. The outstanding established sociology faculty was epitomized by Lynd, whose two books, written in collaboration with his wife, on Middletown (Lynd & Lynd 1929, 1937) are still classics. The faculty had recently been augmented by two young assistant professors, Paul Lazarsfeld and Robert Merton, and soon thereafter by a third, C. Wright Mills. The growing reputation of these new faculty members more than justified their appointments.

Significant numbers are necessary to produce a vigorous atmosphere in a population, and the backlog of graduate students from the war years produced this critical mass. The Columbia sociology department had substantially more than 100 students in those years, a much larger number than in preceding or following years. Merton's popular classes were filled to standing-room capacity, though they were held in a room with 96 chairs and numerous window seats. Not only were there a large number of students, there also were strong social ties integrating them, despite the inevitable competition. The many veterans among them had become emancipated from their parents and so came to Columbia without strong social ties. Most were thrown together for sociability and companionship. This created a camaraderie rooted in common academic interests and manifested in frequent discussions of academic issues. These discussions stimulated an interest in sociological questions in our regular social intercourse.

Lazarsfeld and Merton did not align themselves with the other methodologists and other theorists, respectively. Rather, they joined forces and established a coalition that made the first, and quite possibly most successful, research-cum-theory team in sociology. This cooperation of two faculty members presumably from opposite ends of the sociological spectrum had much impact on graduate students. Increasing numbers, though by no means all, of the students became interested in combining research and theory in one way or another. Given this new direction, Merton and Lazarsfeld came to dominate the department's direction.

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[2] The high quality of the students is illustrated by the outstanding reputation a considerable number achieved. The two years I was in residence, Selznick, Lipset, and Gouldner were completing their dissertations; Rossi, Inkeles, Rose Coser, and Wrong were in my cohort; and the next included Lewis Coser, Coleman, Trow, and Katz.

Merton in particular played an important role in my conversion to an interest in linking theory to research; he helped to wean me from a concern with grandiose philosophical theories remote from empirical research. To be sure, I also became greatly intrigued by the imaginative methods and procedures Lazarsfeld developed, illustrated by his elaboration scheme (Kendall & Lazarsfeld 1950). Merton influenced my change in orientation more, however, because I knew him as an impressive and insightful theorist, which made his emphasis on the need to ground theory in empirical research more effective, given my theoretical predilection.

To represent this new sociological emphasis on linking theory closely with research, Merton later coined the term "middle-range theory." I disagree with the connotations of this term, which imply a mixture of empirical and theoretical elements. Genuine theory cannot be middle range, for it must be distinct from research in two fundamental respects: Its concepts must be abstract and its propositions general, lest it be not testable since it has no new or different implications. An explanation of gang warfare or of some criminal behavior, be it rape or robbery, that deals only with that specific crime cannot be tested by making predictions for other conflicts or controversies.

Indeed, Merton's middle-range theories are really not middle range. Thus, in his article with Kitt (Merton & Kitt 1950), he uses reference group theory to explain a surprising finding from a survey of soldiers in World War II. Promoted soldiers were more likely than privates to be satisfied with the Army's promotion system, as one would expect. Independent of their rank, however, members of the military police, where promotion chances were much worse than in the air corps, were more satisfied with the promotion system than were members of the air corps—contrary to expectations.

The theoretical explanation advanced in terms of reference group comparisons, however, does not refer to some differences between military police and air corps, but to those between any groups that differ in the chances of obtaining some rewards. This is not the middle ground between research findings and theory but a true theoretical generalization, albeit one derived from research findings, yet testable with new empirical predictions, as the article itself in considerable detail indicates (Merton & Kitt 1950:43–45).

If I am correct in saying that the term "middle range" is inaccurate for precise theories as distinguished from vague and untestable ones, it is nevertheless a fruitful error. [Merton himself coined this term for Durkheim's apparently false claim that (anomic) suicide rates increase during periods of increasing prosperity as well as during those of economic depression.] The latent function of the concept of middle-range theory is to narrow the gap between theory and research and to bring them together. The collaboration of Merton and Lazarsfeld repeatedly accomplished this, not by developing specific theories about particular empirical subjects but by constructing general theories based on a series of related empirical results.

THE DYNAMICS OF WORK GROUPS IN BUREAUCRACY

Becoming emancipated from pure grand theory for its own sake surely does not mean completely ignoring it. Neither does it mean confining oneself to purely descriptive empirical studies devoid of theoretical conceptions and implications or to speculative interpretations of texts removed both from the brilliant theoretical ideas of the major classical theorists and from any confrontation of the speculative textual interpretations with empirical reality.

Ignoring the brilliant insights of the major classics is surely not what Merton taught, nor what he practiced in his own work. The issue is that one should not confine oneself to the conceptual level of the classics and merely interpret their concepts or relate them to one another. Rather, one should learn either to use their great ideas in empirical research or to refine them by drawing out their implications for new substantive problems and making their propositions more precise in the process. This is well illustrated in what is one of Merton's best known, if not his most famous, paper—"Social Structure and Anomie"—published originally in 1938.

This paper, extending a major concept of Durkheim's in new ways, was revised in published form repeatedly by Merton in the next three decades, quite aside from the numerous intervening oral refinements in lectures or "oral publications," the oxymoron he himself used. (Moreover, Merton recently [1994] published a long manuscript elaborating these extensions of his anomie theory.) Here—as well as in several other cases—Merton, far from rejecting the ideas of a classical theory, is so captured by them that he keeps returning to his own first elaboration of them to improve it and thus further refine them.

I, too, have been inspired and stimulated by classical theorists in my work, particularly by Weber, Durkheim, and Simmel, and I have often used their ideas in my research and analysis. The first major expression of this was in the choice of my dissertation topic. Weber's theory of bureaucracy aroused my particular interest, because it is the prototype of the "iron cage," Weber's term for the increasing confinement of individual freedom by the growing rationalization and bureaucratization of modern life. More generally, bureaucracy dramatically illustrates structural constraints—the limits structural conditions impose on individuals' choices and opportunities—which I consider to be the central subject matter of sociology.

I decided to conduct empirical research on bureaucracies for my dissertation,

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using as a conceptual framework Weber's theory of bureaucracy. A popular research subject at that time was the empirical study of work groups in industry. The best-known example is the study of several groups of manual workers in one of the plants of the Western Electric Company—*Management and the Worker* by Roethlisberger & Dickson (1946). I had taken a course in industrial sociology with Conrad Arensberg, in which studies of work groups in industry were analyzed and a method for systematically recording the social interaction among their members was presented (Chapple & Arensberg 1940). I decided to undertake an equivalent study on bureaucracy. If the operations in a factory can be clarified by studying industrial work groups, one should be able to throw light on operations in a bureaucracy by observing groups of officials at work.

Early during my observation period I noticed that the officials in the federal law-enforcement agency I first studied often discussed problems in their cases with colleagues, although every official worked on different cases and it was officially proscribed to consult anyone but the supervisor (who might refer intricate legal problems to the legal department). This intrigued me because it was similar to the prohibited practices reported among manual work groups such as restriction of output. When I studied it further, however, I found that it was quite different and far more interesting. I discovered unofficial consultations, the informal stratification system it generated, and the diverse consultation practices by which people sought to protect or improve their informal status.

The analysis of unofficial consultation and the informal status structure it produced gave me the idea for the theory of social exchange I later elaborated (1964). Even before I did so, Homans (1961) developed a theory of social exchange based on substantially different assumptions, in which he also used my analysis of unofficial consultation as the prototypical illustration of social exchange processes. Paradoxically, in my field study of bureaucracy, based on Weber's macrosociological theory of it, I had discovered the kernel of a microsociological theory.

Before either exchange book appeared, my dissertation was published after several revisions (1955), and Homans (1956) reviewed it. His review was gratifyingly favorable, but he first criticized the title (*The Dynamics of Bureaucracy*), saying that the book was a study not of bureaucracy but of small groups of officials. I had to admit that he was right. I did not study the concepts in terms of which Weber analyzed bureaucracy—large size, division of labor, administrative hierarchy, impersonal decisions—but the informal social processes and status structures in work groups. This is why a micro and not a macro theory emerged from it. But how would one study the issues Weber poses—for instance, whether the attributes he considers to characterize bureaucracy do in fact occur together in formal organizations? Answers would require data on many cases, but how can one survey many organizations if data collection on a few work groups takes a full year? This question had a sleeper effect on me. Right then I could not deal with it, as I was involved in another empirical study.

ANALYSIS OF A NATIONAL SURVEY

I was appointed assistant professor at the University of Chicago in the fall of 1953. The sociology department had just lost four senior faculty members: Burgess and Ogburn had retired, Wirth had unexpectedly died, and Blumer had accepted the chair of the sociology department at Berkeley. Everett Hughes, the new chair, rebuilt the department by hiring mostly recent PhDs, among them several from Columbia University. I was followed by Peter Rossi, Elihu Katz, and James Coleman. There were several other young faculty members, notably Otis Dudley Duncan (the only one already in residence when Hughes started to chair the department), Fred Strodtbeck, and Anselm Strauss. The diverse faculty—newcomers and old-timers, quantitative and qualitative sociologists—created a stimulating academic atmosphere, albeit one with some conflict, which, however, contributed to the vigorous climate.

My interest in Marxian theory of class differences and my socialist background were reflected in some academic interest in stratification and mobility. Although I had written only a few papers on the subject, I was a member of the International Sociological Association's Research Committee on Stratification, which in the 1950s had as its objective to encourage its members to conduct national surveys on stratification and mobility in their respective countries. Such surveys had been conducted in Britain under Glass's (1954) direction and in Sweden by Carlsson (1958); one on Denmark was in progress by Svalastoga (1965).

Despite the prominence of US scholars in survey research, however, no national survey on stratification and mobility had been carried out in this country. I was encouraged to undertake one, and I reluctantly decided to try. I was fully aware that I did not have the statistical competence to analyze a quantitative national survey adequately on my own and that I needed a collaborator who had the necessary methodological skills. I asked Duncan, who did (and who became one of the best quantitative sociologists), whether he would join me in conducting such a survey, and he agreed to do so. To carry out this large project, we needed both the cooperation of the US Bureau of the Census for data collection and the necessary financial support from the National Science Foundation.

Although completing these essentially preliminary steps took several years, we were finally successful in obtaining approval for our grant proposal and agreement from representatives of the Census Bureau to collect data for our study. These data were obtained in a self-administered supplement to their monthly "Current Population Survey" in March 1962.[3] Since the information on individuals is confidential, we did not have direct access to the data, but the Bureau of the Census prepared multivariate cross-tabulations for us from which all analysis was carried out. Duncan was very ingenious and foresightful in requesting tables that included all the data we would need for regression analysis.

The book in which the analysis of our research is published—*The American Occupational Structure*—is generally known, and there is little point in summarizing it here. Suffice it to say that our objective was to obtain data on American stratification and mobility comparable to data from other nations. We wished to ascertain major characteristics that influence differences in people's occupational achievements and in their opportunities to move up from their social origins. For this purpose, we not only analyzed the conventional mobility matrix, cross-tabulating the occupational origins and current occupations of respondents, but we also used another procedure with three new elements.

These three new statistical procedures were introduced by Duncan. First, we used regression analysis, which had been used only very rarely before in sociological surveys except in demography. Second, to use regression analysis we had to convert (detailed) occupations into a measure of occupational status that could be treated as a continuous variable. The measure used was Duncan's (1961) socioeconomic index, based on the prevailing education and income of the members of each detailed occupation. Third, Duncan (1966) introduced path coefficients, employed by Sewall Wright (1960) in his biometric work, into sociological analysis; these enabled us to trace the influences from every independent variable, via possibly various intervening variables, to the dependent variable. After our book's publication in 1967, regression and path analysis became widely used in sociological research on other topics as well as on occupational mobility.

The project was not designed to make a theoretical contribution but to provide a baseline for future trends in the American occupational structure and for comparisons of it with those in other countries. To be sure, we interpreted a number of our findings in theoretical terms. Thus, we pointed out that while we observed no vicious circle of poverty for people generally, we did see one for blacks, as indicated by their cumulative disadvantages in comparison to whites. At each step of their careers, blacks are handicapped even when they have overcome earlier handicaps. Thus, statistical analysis shows that even if blacks had the same educational opportunities as whites, as they do not, they would get less good jobs; and even if they had the same occupations as whites, which they do not, their earnings would be lower.[4] In another connection, we derive some inferences from several findings about expanding universalism in American occupational life. But such ad hoc interpretations do not contribute to a general theory that is testable in research on other subjects.[5]

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[3] Glass originally suggested that I might get the necessary data free of cost by asking the Bureau of the Census to add a single question to one of their regular population surveys—occupation of father. As it turned out, the data we needed required an entire supplementary questionnaire, and the cost the Census Bureau charged for it was a large part of the entire grant from the National Science Foundation.

The main contribution of this study, which made it so popular and influential, consisted of the methodological innovations Duncan introduced. Our long collaboration on this research, which involved repeated disagreements owing to our very different sociological orientations, also furthered progress on my own serpentine path to a macrostructural theory. Used to the Lazarsfeld tradition of statistical analysis based on cross-classifications, I was not familiar with regression analysis; initially I tried to convince Duncan that we should use cross-tabulations instead. But he resisted, and since he was more knowledgeable about quantitative procedures, I had to give in. After I became used to regression analysis, however, I was completely sold on it, owing to its ease of examining multiple influences, their polynomials, and their contingent (interaction) effects. I continued to employ it in my subsequent research, including that testing macrostructural theory.[6]

RESEARCH ON WEBER'S THEORY OF BUREAUCRACY

After we completed the mobility study, I returned to thinking about the problem Homans posed in his review when he suggested that a field study of work groups in government bureaus is not a study of Weber's theory of the formal structure of bureaucracy. To refine, let alone to test, a theory of formal organizations, information on many of them is necessary. As I carefully reread Weber's analysis of bureaucracy with this caveat in mind, it occurred to me that his theoretical scheme does not deal with the personal daily behavior, attitudes, and social interaction of officials at all. His concepts are exclusively concerned with the formal characteristics of bureaucracies: their large-scale operations, division of labor, administrative hierarchy, different subunits of various kinds and on various levels, official decisions and relations governed by impersonal rules. These conditions are assumed to promote administrative efficiency.

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[4] I use the present tense although the data referred to are from 1962, because despite some improvements these statements are apparently still correct.

[5] Although based on a sample of more than 20,000 respondents, from the structural perspective our research is a case study of a single social structure.

[6] Ironically, at the end of his career Duncan started using log-linear procedures, which, though greatly refined, ultimately rest on Lazarsfeld's old-fashioned cross-tabulations.

It dawned on me that data on all these conditions can be obtained from records and informants and do not require surveys of all or even a sample of members of the organization, let alone direct observation for months of every kind of groups of officials. (To be sure, such data would provide interesting additional information on various conditions Weber did not include in his theoretical scheme, but they are not needed for the empirical analysis of the concepts of this scheme.) To use an absurd example, to find out the number officials as an indication of scope of operations, one would not interview all of them and then count the interview schedules; one would simply obtain their number from records or informants.

The case for other data is not quite so obvious, but the same principle applies. The division of labor, the proportion of administrative staff, the number of hierarchical levels, the number of officials with different ranks, the number of subdivisions of various kinds and on various levels, the volume and specificity of written operating rules—all these and many other conditions in a bureaucracy can be ascertained from records, the table of organization, and informants. Much of this information can be obtained from a detailed table of organization—not from the official one, which is often out of date and always insufficiently detailed, but from a new one constructed by having the official one corrected and expanded in interviews with appropriate informants.

If these considerations are not completely mistaken, a research assistant or two should be able to obtain a bureaucracy's administrative structure in a visit of a few days. I decided to try to carry out such a design and thus wrote an application to the National Science Foundation for a grant to support some pilot studies. The major one was an investigation of all state Employment Security Agencies (ESA) to obtain information on their administrative structure. To my own surprise, considering the unusual research design, I obtained the grant; I also obtained the cooperation of the US Bureau of Employment Security for such a study. After some preliminary pilot studies including some at ESA regional headquarters, three research assistants visited every state headquarters of the ESA at each state capitol for a few days, collecting extensive information on the formal structure of the entire agency and much more limited data on that of its larger local offices.

Thus, we had detailed data on 53 state agencies (in addition to those in the 50 states, data were collected on three of the four other ESAs—the District of Columbia, Puerto Rico, and the Virgin Islands, but not that in Guam). We also had much sparser data on 1201 local offices of these agencies. This [53] is a small number for regression analysis, but it is essentially the entire universe of ESAs.[7] We also analyzed 387 major divisions as cases, and the analysis of local offices was based on data from 1201. During the next decade, quantitative research on a variety of public and private organizations was conducted, each project confined to a single type. Examples of the public bureaus studied are public personnel agencies and finance departments. The studies of private and nonprofit organizations included department stores, manufacturing concerns, hospitals, and universities and colleges.

I developed a theory to explain the regularities observed in this research on public employment agencies (which are also responsible for unemployment insurance). The basic findings incorporated in the theory are the following: First, the large size of organizations increases their differentiation in various dimensions at decelerating rates. This is the case whether the division of labor, vertical levels, horizontal subdivisions, or other forms of differentiation are examined. For every form of differentiation, in other words, the size of an organization is positively related to the extent of differentiation, but all these correlations are most pronounced for smaller organizations and become increasingly attenuated for those in the larger size range. In mathematical terms, the influence of size on differentiation is indicated by a polynomial with a positive main and a negative squared term.

Second, large size reduces administrative overhead (the proportion of administrative personnel), which implies an administrative economy of scale. Third, degree of differentiation, which entails greater structural complexity, is positively related to administrative overhead. Finally, large size directly reduces yet indirectly (mediated by its influence on differentiation) increases administrative overhead; but the direct negative exceeds the indirect positive effect on administrative cost; this produces the net negative effect that finds expression in the administrative economy of scale.

The theory seeks to explain why the rate of differentiation with the increasing size of organizations declines for larger organizations. The inference made is that the feedback effect of the rising administrative cost of increasing organizational differentiation, and hence complexity, with growing size are responsible. To sustain the economy of scale in administrative cost from which large organizations benefit, they must not become so differentiated that the administrative cost of complexity absorbs this economy of scale; this is effected by dampening the influence of expanded size on enhancing differentiation and complexity.

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[7] I had originally thought that this ESA project was the first quantitative study of formal organizations, but I was wrong. The first one was probably Woodward's (1958) analysis of British industrial firms. Another British one was published by a group at Aston University in Birmingham, about the same time as our ESA study, in a series of articles in the *Administrative Science Quarterly*; the first of the series analyzing research (an earlier one was a literature review) is Pugh et al (1968).

This theory has been corroborated in the research on other organizations. Whatever type we examined, whether public, private, or nonprofit, large organizations were more differentiated in various dimensions than were small ones; their administrative overhead was less than that of small ones, despite the fact that their differentiation (and hence large size, indirectly) raised administrative overhead. This strong supportive evidence for the empirical findings strengthens confidence in the inference derived from them that the dampening effect of the administrative cost of complexity on the effect of size on differentiation can account for the *decline* in the rate at which differentiation increases as size does.[8]

The importance of abstract concepts clearly distinct from any empirical variables implied by them is well illustrated by this theory, as is the importance of theoretical generalizations beyond their empirical manifestations. To be sure, the theory is derived from empirical data and their relationships. But theoretical insights often emerge from empirical research, sometimes unexpectedly (what scientists refer to as serendipity) and at other times from exploratory research designed to search for new theoretical ideas. Although generalizations directly based on research findings may make some theoretical contribution, however, they also have some shortcomings, a limitation like that of middle-range theories, that is, they do not imply new empirical tests, though more abstract theoretical hypotheses inferred from them would.

The concept of differentiation is truly an abstraction from diverse manifestations of it, like division of labor, hierarchical levels and ranks, branch offices in different locations, and diverse subunits of various kinds on different levels. But the case of administrative overhead is different. Whereas it may be defined to include only a variety of staff personnel or to include also the organization's administration (its management on senior levels), in either case it refers to an empirical segment of the population and not to an abstraction. The distinctive significance of management should be noted. Only senior managers have the authority to organize the work and to order others to perform it. In short, senior managers have power over the life chances of workers, which the support staff has not.

The only thing an organization's administrative management and staff have in common is that they are not production personnel; they do not directly perform operations that contribute to the organization's objectives. A theoret-

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[8] Cross-sectional studies by others of these relationships in organizations generally support our findings (based on cross-sectional studies), but studies of changes within organizations were inconsistent and did not support them. (See Cullen et al 1986, who also summarizes other studies.) Longitudinal studies that pool organizations, rather than examine their internal changes, found that growth reduces administrative overhead, in accordance with my theory, but decline in size does not raise it, contrary to what is implicit in the theory (Freeman & Hannan 1975).

ical abstraction, however, must refer to an underlying common denominator of diverse empirical variables, not simply to nonmembership in a given population segment. Surely, that one is not a ditch digger or not a Supreme Court Justice is not a theoretical abstraction. Whatever the definition of the administrative component, therefore, it is not an abstract theoretical term, but rather one of two alternative ways of defining empirically a component of the personnel of an organization.

Whereas the theory has been supported by a variety of organizations, they all were formal organizations. The reason is not merely that our research program studied only various organizations. It is also that the theory is not testable in groupings of people that have no designated administrative component. Ethnic groups, social movements, families, corner gangs, social classes, age cohorts, neighborhoods, educational categories, and innumerable other subdivisions of society can be characterized in terms of their differentiation in various respects, but they do not have administrative components, unless they establish or become formal organizations, as social movements that become political parties do.

Generalizations about diversity, inequality, or other forms of differentiation could be advanced for and tested in these other groupings, but it would not make sense to test generalizations about a non-existing administrative component. In short, the theory based on Weber's scheme is confined to formal organizations, though not to public bureaucracies, which is a limitation for a sociological theory. Can sociological theories apply to all populations? I seek to answer this question with a case in point.

A THEORY OF POPULATION STRUCTURE

Before presenting a brief synopsis of the macrostructural theory at which I have arrived on my twisted route through more than half a century of work in sociology, I want to note what I consider the function of theory to be and how my conception is related to and differs from those of the philosophers of science who influenced me most.

A theory's function is to explain some phenomena, which may be empirical regularities or themselves lower-level explanations or theories. An explanation, as Braithwaite (1953:348–49) put it, "is an answer to a 'Why?' question which gives some intellectual satisfaction." This is also true for common-sense explanations; the difference between them and scientific explanations is that the latter require greater logical and methodological rigor. Specifically, "[a] scientific system consists of a set of hypotheses which form a deductive system, that is, which is arranged in such a way that from some of the hypotheses all other hypotheses logically follow. The propositions...[are] arranged in an order of levels..." (Braithwaite 1953: 12).

Not all explanations are theories. Simpler ones merely furnish the *explicandum's explicans.* One can answer a "Why" question about a particular occurrence or regularity by specifying its cause, the antecedent that produced it, either as a necessary condition for it or as one of several influences on it. But this answer raises another question: Why does *x* cause or help bring about *y*, whether as a necessary condition or as one of several possible influences? To answer this question requires a generalization of which the *explicandum* is a particular instance or manifestation, and if the connection between these two is logically sound, it is the first step in theorizing.

Only the first step, however, because other generalizations may also logically imply the same cause-and-effect relationship. Whether there is one theoretical generalization or two or more alternative ones that can account for the original relationship, a genuine generalization has numerous implications that are entirely different from the original proposition it was advanced to explain. These new implications of the generalizations for diverse empirical relationships make it possible to test them.[9] Although this is an idealized image that rarely can be fully realized in sociology, and most of my theoretical analysis has not realized it, I believe that the macrostructural theory adumbrated below comes, at least, close.

My conception of theorizing has been much influenced by Popper ([1934] 1959) as well as by Braithwaite, although I disagree with some of Popper's criteria of proper theorizing. However, I am in general agreement with his and Braithwaite's method of falsification for testing theories and the conception of theory on which it rests. A theory is a system of logically interrelated propositions on different levels of generality, which logically imply empirical predictions that make them testable and falsifiable. Theories can never be verified, owing to their generality (even if all known tests support it, a future one may not), and possible alternative theories may explain the same phenomena, but theories can be falsified. A theory is falsified if it is ascertained that one of its empirical implications, properly derived from it, is not confirmed in research. (This statement will later be modified.) Theories that have not been falsified in repeated empirical tests are tentatively accepted as corroborated, though they may still be falsified in the future.

One criticism I have of Popper's scheme is his rigid and emphatic assertion that only deduction is relevant for scientific theorizing and that induction is entirely irrelevant (1959:27–30, 34–39). To be sure, deducing a less from a more general statement is the logically correct procedure, and inducing a more from a less general one is a logical fallacy. But how do scientists ever discover theoretical generalizations? Popper is aware of this problem but simply dismisses it by stating (p. 31) that "inventing a theory... is irrelevant to the logical analysis of scientific knowledge." Although this may well be true, it merely reveals the irrelevance of rigid epistemology for the most important task of practicing theorists, namely, how to discover new explanations and be guided in the thoughtful processes of meditation and exploration that precede formalization of theories.

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[9] If different theories have the same empirical implications and thus explain—logically imply—them equally well, an empirical subject must be found for which they have opposite implications, which makes it possible to decide between them by ascertaining which makes the right prediction. If no such subject can be found, the theories must be considered to be essentially equivalent.

Whereas there are no strict epistemological principles for deriving theoretical generalizations from various empirically observed recurrent relationships or less general theoretical propositions, nevertheless, scholars and scientists have developed procedures to help them to advance general theoretical hypotheses that subsume, and thereby explain, diverse empirical findings and limited theories on different subjects. The best illustration is reconceptualization, which involves discovering common elements in a variety of research results or narrower theories and then reconceptualizing the apparently disparate elements in abstract and theoretical terms that subsume the underlying common denominator they share. To be sure, this is easy to say but most difficult to do, which is why sciences mature slowly.

I agree with the refinement of Popper's theory by Lakatos ([1970] 1977), in which he distinguishes naive from sophisticated falsificationism. The former rejects a theory on the basis of a single falsified prediction, the latter does not. Lakatos credits Popper for having moved, at least implicitly, from a naive, in his early work, to a sophisticated falsificationism in his later work, and Lakotos's own analysis expands this change and makes it explicit. His first major point is that theoretical generalizations not only cannot be verified, neither can they be falsified [implicit in Popper's (1959: 53–54) remark that tested theories must not be rejected without good reason]. He provides several grounds for their not being falsifiable, notably that "theories are normally interpreted as containing a ceteris paribus clause" (p. 101).

Lakatos's central point is that a theory is not rejected for any falsified prediction unless another better theory has been developed. Complex theories have many diverse implications, and often most of these implications are corroborated in research while one or a few are falsified. If this occurs for competing theories, as is not rarely the case, it indicates that they are inconsistent, though it does not indicate which one is false. In this situation, Lakatos suggests, attempts are made to make them consistent by finding false assumptions or propositions and replacing them. Only when a new consistent and improved theory has been created are the old ones rejected. What are the criteria of a superior theory? It has a wider range of diverse implications than any other and thus is more easily falsifiable [as Popper (1959: 13) already stressed]; and none or few of those empirical implications have been (possibly as yet) falsified while most of them have been corroborated in research.

My last disagreement with Popper is that I cannot accept his criterion of a theoretical generalization that it must be universally applicable. To be sure, a generalization must have no exceptions, but it can be confined to one field in a discipline and not to others. Indeed, most theories are so confined; the theory of optics does not explain nuclear energy. Popper often uses as an example of a universal generalization that all ravens are black, which I consider an empirical regularity and not at all a theoretical generalization. I adopt Braithwaite's criterion for theoretical terms that they must be abstractions from empirical observations and not merely combinations of operational variables.[10]

In conclusion, we finally arrive at the macrostructural theory I have developed in accordance with the criteria of theorizing outlined above. My central interest is the influence of the social structure of a population on people's life chances, not only the opportunities in their careers but also their other opportunities, such as their chances to make certain friends or marry certain spouses. Population structures are characterized by the population distributions in different dimensions, such as ethnic distributions or occupational distributions. Three generic population distributions are distinguished: heterogeneity, the distribution among nominal categories, such as ethnic affiliation; inequality, the distribution among graduated differences, such as education or income; and intersection, which is the opposite of the degree to which differences in various respects are highly correlated in a population.

Intersection corresponds to Simmel's ([1908] 1923) concept of crosscutting social circles. All three generic differences among populations are abstract concepts in Braithwaite's sense and also in Simmel's—pure social forms abstracted from their contents. There is no heterogeneity as such, only particular empirical manifestations of it, like religious heterogeneity or diversity in national background, just as there is no competition as such, only economic, political, or some other competition. I consider Simmel's forms to be theoretical abstractions in Braithwaite's meaning of the term—theoretical abstractions appropriate for sociological analysis. All three population characteristics are emergent properties which have no counterparts that refer to individual attributes, whereas a population's mean income, for instance, is not an emergent property but describes the population by an average characteristic of its members.

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[10] In Braithwaite's (1953:76) own words: "A theory which it is hoped... in the future to explain more generalizations than it was originally designed to explain must allow more freedom to its theoretical terms than would be given to them were they to be logical constructions out of observable entities."

The theory developed deals with the influence of the population structure on chances of intergroup relations, defined as the rate of dyadic relations between persons whose social affiliations differ in any respect. The two basic assumptions refer, respectively, to the dependence of social associations on contact opportunities, and to the oft-demonstrated tendency for ingroup relations to be more prevalent than outgroup relations. The theory is exemplified here by three major theorems. The first assumption and the definition of heterogeneity imply the theorem that heterogeneity promotes intergroup relations. The same assumption and the definition of inequality imply that inequality promotes intergroup (status-distant) relations. (This seems implausible, but tests support it—as shown below in note 12). Probability theory is implicated in these two theorems. The second assumption and people's multigroup memberships, which Simmel emphasized, imply that intersections of social differences promote intergroup relations.

After it had been published, the theory was tested by comparing the population structures of the 125 largest American metropolitan areas in 1970 and ascertaining, as implied by the theory, their influence on intermarriage (Blau & Schwartz 1984). This is a severe test, since as profound and lasting a relation as marriage is less likely than casual relations to be influenced by sheer probability. The tests were conducted on numerous empirical manifestations of heterogeneity, inequality, and intersection, as they influenced intermarriage.[11] With rare exceptions, all tests supported the theoretical predictions, as did tests carried out with somewhat improved procedures on the same theorems and some tests that tested different theorems, for example, those on conflict.[12]

This project intersects two major interests of mine, as an academic and as a progressive. Ever since graduate school, I have been fascinated by the effects of the impersonal social structure, like a population's sheer composition, on people's opportunities, a point illustrated by this study. As a political animal, I have been horrified by the recent growth in poverty and inequality in this country and growing ethnic strife throughout the world. The study shows that multiple diversity of a population promotes tolerance, not merely casual contacts but friendships and even marriage between persons with different backgrounds, which may well portend improving social integration of society's diverse groups and strata.

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[11] Virtually all those available in the PUS of the Bureau of the Census for 1970.

[12] To answer the implicit question raised above by the implausible finding on status-distance: Although inequality in education and socioeconomic status makes status more salient and thus indirectly discourages status-distant marriage, this indirect negative effect is overshadowed by a direct positive one, which makes status-distant marriage more likely owing to the greater average status-distance between any two persons implicit in greater inequality.

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Literature Cited

Blau PM. 1955. *The Dynamics of Bureaucracy.* Chicago: Univ. Chicago Press

Blau PM. 1964. *Exchange and Power in Social Life.* New York: Wiley

Braithwaite RB. 1953. *Scientific Explanation.* Cambridge: Cambridge Univ. Press

Carlsson G. 1958. *Social Mobility and Class Structure.* Lund: Gleerup

Chapple ED, Arensberg CM. 1940. *Measuring Human Relations. Genet. Psychol. Monogr. XXII*

Cullen JB, Anderson KS, Baker DD. 1986. Blau's theory of structural differentiation revisited. *Acad. Manage. J.* 29:203–29

Duncan OD. 1961. A socioeconomic index for all occupations. In *Occupations and Social Status,* ed. AJ Reiss, PK Hatt, CC North, pp. 109–38. New York: Free

Duncan OD. 1966. Path analysis. *Am. J. Sociol.* 72:1–16

Freeman JH, Hannan MT. 1975. Growth and decline processes in organizations. *Am. Sociol. Rev.* 40:215–28

Fromm E. 1941. *Escape from Freedom.* New York: Farrar & Rinehart

Glass DV. ed. 1954. *Social Mobility in Britain.* Glencoe: Free

Homans GC. 1956. Review of *The Dynamics of Bureaucracy. Am. J. Sociol.* 61:490–91

Homans GC. 1961. *Social Behavior.* New York: Harcourt, Brace & World

Kendall PL, Lazarsfeld PF. 1950. Problems of survey analysis. In *Continuities in Social Research,* ed. RK Merton, PF Lazarsfeld, pp. 133–96. Glencoe: Free

Lakatos I. (1970). 1977. Falsification and the methodology of scientific research programs. In *Criticism and the Growth of Knowledge,* ed. I Lakatos, A Musgrave, pp. 91–196. New York: Cambridge Univ. Press

Lynd RS, Lynd HM. 1929. *Middletown.* New York: Harcourt

Lynd RS, Lynd HM. 1937. *Middletown in Transition.* New York: Harcourt

Merton RK. 1938. Social structure and anomie. *Am. Sociol. Rev.* 3:672–82

Merton RK. 1994. *The Legacy of Anomie Theory. Advances in Criminological Theory,* Vol. 6, ed. F Adler, WS Laufer. New Brunswick: Transaction

Merton RK, Kitt AS. 1950. Contributions to the theory of reference group behavior. In *Continuities in Social Research,* ed. RK Merton, PF Lazarsfeld, pp. 40–105. Glencoe, IL: Free

Parsons T. 1937. *The Structure of Social Action.* New York: McGraw-Hill

Parsons T. 1951. *The Social System.* Glencoe: Free

Popper KR. (1934) 1959. *The Logic of Scientific Discovery.* New York: Basic

Pugh DS, Hickson DJ, Hinings CR, Turner C. 1968. Dimensions of organization structure. *Admin. Sci. Q.* 13:65–105

Roethlisberger FJ, Dickson WJ. 1946. *Management and the Worker.* Cambridge: Harvard Univ. Press

Simmel G. (1908) 1923. *Soziologie.* München: Duncker & Humblot

Svalastoga K. 1965. *Social Differentiation.* New York: McKay

Woodward J. 1958. *Management and Technology.* London: HMSO

Wright S. 1960. Path coefficients and path regressions. *Biometrics* 16:189–202

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THEORETICAL AND COMPARATIVE PERSPECTIVES ON CORPORATE ORGANIZATION

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ABSTRACT

The study of corporate governance has expanded both its theoretical and its empirical scope. We define governance broadly to include the social organization of firms and their relations to their suppliers, customers, competitors, and states. This review examines both economic and sociological theories to evaluate their efficacy at accounting for the comparative data on firms. Our review of the comparative literature suggests that there is no evidence of convergence across societies toward a single form of governance, and that this is mainly a function of three factors: the timing of entry into industrialization and the institutionalization of that process, the role of states in regulating property rights and rules of cooperation and competition between firms, and the social organization of national elites. The theories that function best are those that consider political, institutional, and evolutionary factors as causal. This is a cautious conclusion as many of the theories have not been evaluated because of the difficulty in producing comparative measures.

INTRODUCTION

Recent work has brought issues of corporate governance to the forefront of organization theory (Williamson 1975, 1985; Fama & Jensen 1983 a,b; Flig-

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stein 1990; Campbell & Lindberg 1990). We define corporate governance broadly to include the social organization of firms and their relation to their environments including their relation to states. There is now widespread agreement across a number of disciplines that the viability of the industrial enterprise is intimately linked to issues of governance. Despite this accord, however, significant theoretical differences still exist over how to explain variations in governance structures. Economic accounts have focused on efficiency considerations, while work in sociology has tended to emphasize social, political, and cultural factors.

All of these approaches implicitly or explicitly conceptualize corporate governance as a problem of managing interdependence. To ensure continued growth and profitability, owners and managers must make sure that organizational processes are performed smoothly and predictably. Yet each entails interdependence between different actors within the corporation and between the corporation and the larger social world of which it is a part. Those seeking to govern the firm must gain control over the firm's internal and external environments in order to manage and stabilize these interdependencies.

The problem of internal control focuses primarily on issues of hierarchy and motivation. The basic condition of interdependence creates what economists call the principal-agent problem (Fama 1980). Actors responsible for the firm's performance do not carry out production and implement policies by themselves but are dependent on others to do so. They must therefore find some means of motivating or inducing those actors to perform such tasks in consummate rather than perfunctory fashion. The literature on organizations typically identifies three different types of internal control problems: the relationship between management and workers; the separation of ownership and control (Berle & Means 1965); and the division of labor between different levels of management (Chandler 1962, 1990; Freeland 1994).

Issues of external control involve an even wider range of interdependencies, including interactions with competitors, suppliers, capital markets, and the state. It is generally assumed that corporate management must ensure stable, predictable relationships with each of these sets of actors in order to achieve profitability and growth. Relations with competitors, for example, center around explicit or implicit understandings about how business is to be carried out and the form competition will take (White 1981). In transacting with suppliers, management must ensure that quality is adequate, delivery is timely, and prices stable. Relations with the state are even more complex. Because the state defines and regulates the conditions that make transactions possible, including the limits of contract and property rights, it holds the power to legitimize various concrete institutional arrangements.

Few theories of governance attempt to examine all of the interdependencies between the firm and its environments. Instead, they tend to argue that one set of interdependencies, be it agency costs, transaction costs, population density, power, information, trust, or institutional legitimacy is critical to organizational survival. It is this focus on different interdependencies as causal mechanisms that has led to competing frameworks to explain corporate governance structures.

Not surprisingly, approaches that focus on different causal mechanisms reach divergent conclusions about the modern corporation. Efficiency analysts, for instance, often contend that as firms face similar constraints in worldwide markets, a convergence of organizational forms is likely to occur (see, for instance, Jensen 1989). Others see governance structures as politically and culturally unique entities arising out of historically specific circumstances and conditions (Hamilton & Biggart 1988, Fligstein 1990).

In this review, we seek to assess the adequacy of existing explanations that purport to account for variations in corporate governance arrangements across societies. We are particularly interested in the extent to which existing theories can explain three types of corporate issues: the structure of property rights, the nature of competitive and cooperative arrangements across firms, and the strategies that firms use for growth and expansion, particularly with regard to vertical integration and diversification. We review economic and sociological accounts of corporate governance, showing that the two literatures posit different types of causal mechanisms to account for variations in organizational form. Drawing on recent comparative work that focuses on industrial organization across a number of societies, we then review the existing empirical literature. We conclude with a discussion of the implications of these findings for future research.

Two caveats are in order. First, most of our discussion focuses on institutions that figure prominently in economic theory and are less the focus in sociology. This means that the economic theories will seem more concerned with the issues reviewed here than are the sociological ones, although the sociological theories tend to have broader objects as their focus of explanation. We think this helps focus the comparative discussion, but we also recognize that it limits our ability to discuss a wide range of issues. Second, much of what is discussed concerns the largest corporations. This is because most of what is known and theorized is limited in this way. We accept this limit and suggest that our conclusions may be limited to the largest firms.

ECONOMIC THEORIES AND MECHANISMS

Neoclassical theory paid little attention to issues of corporate governance. It conceptualized the firm as a production function possessing perfect information and operating in competitive product markets. In this theory, entrepreneurs would be forced to deploy their capital in an efficient manner or go out of business, and the study of the firm was a case of "applied price theory" (Stigler

1968). From this perspective, the growth of oligopolies, strategies involving product diversification, and the vertical integration of production processes were all seen as mechanisms that created barriers to entry or undermined price competition (Caves 1980).

Nowhere was the identification of the modern corporation with inefficiency clearer than in Berle & Means's (1965) thesis concerning the separation of ownership and control. In the 1950s, managerial economics began to develop formal models of how the separation of ownership and control affected the organization of the firm (Baumol 1959, Marris 1964). This literature argued that managers would pursue growth in sales or assets over profits in order to increase their own salaries or status (Marris 1964). Although the empirical work did not turn up a lot of positive evidence for this perspective (for a review, see Caves 1980), this literature reinforced the neoclassical view that the firm reflected inefficiencies in the price mechanism.

While the "new" institutional economics is a heterogeneous phenomenon, its adherents commonly share two critiques of neoclassical theory. First, such approaches contend that the firm is the dominant form of organization in capitalism, and that economics is incomplete if it cannot account for its emergence. Second, and even more important, the new institutional economics contends that firms would not be ubiquitous if they did not help create efficient outcomes. In this literature, modern property rights, the separation of ownership and control, and the building of organizational hierarchies are all seen as mechanisms that generate efficiency.

One source of the new institutional economics was the work of Coase (1937), who argued that firms emerged because there were "transaction costs" involved in entering markets, negotiating for goods and services, and enforcing contracts. Coase suggested that if the cost of carrying out a transaction in the market was higher than the cost of carrying out the same transaction within the firm, firms would internalize the transaction in order to lower costs. In this scenario, firms emerge and grow precisely when they are more efficient than the market.

The second major forerunner of new economic theories of the firm was the work of the Carnegie School (Simon 1957, March & Simon 1958). Herbert Simon laid the basis for this approach by modifying the neoclassical assumption that economic decisions were made by perfectly rational actors possessing relatively complete information about the situation in which they acted. Focusing on the fact that humans have limited information processing capabilities and that information is often imperfect or unavailable, he argued that economic actors suffered cognitive and informational constraints that made it impossible to achieve optimal decisions. Instead, actors had general goals in mind and would search for whatever solution they could find that more or less attained these goals, a process he referred to as "satisficing."

Organizational structure was shaped by attempts to reduce the effects of these cognitive and informational constraints (Simon 1957, March & Simon 1958). By breaking corporate goals down into their constituent elements and assigning them to different subunits within the firm, managers reduced the amount of information necessary to monitor organizational performance, thereby relieving cognitive strain and minimizing the chance of information overload for a given unit. This process also provided actors in the subunits with clear cognitive outcomes to attain, thus aligning individual behavior with the overall goals of the organization (Simon 1960). In addition, subunits developed "standard operating procedures" that further simplified cognitive processing by allowing for the easy reproduction of organizational competencies. Organizations that recognized the limits of human cognition and the role of information in organizational life were more efficient and able to survive.

The transaction cost economics (TCE) of Oliver Williamson (1975, 1981, 1985) focuses on the cost of devising, monitoring, and carrying out economic transactions between or within firms, arguing that governance structures—"the explicit or implicit contractual framework within which a transaction is located (markets, firms, and mixed modes)"—are shaped by such costs (1981, p. 1544). Like Simon, Williamson assumes that economic actors are boundedly rational, and he further asserts that at least some actors will behave opportunistically, engaging in "self-interest seeking with guile" (1975, p. 26). Imperfect information raises the cost of contracting by making it more difficult to predict future outcomes. Opportunism makes it necessary to monitor transactions for malfeasance, further raising the cost of governance.

TCE argues that under certain conditions of high asset specificity, market transactions become subject to higher levels of opportunism and bounded rationality, making them more costly to govern. Asset specificity refers to a situation in which resources necessary to carry out a transaction involve "durable transaction-specific investments" that cannot be used for another purpose without significant financial loss (Williamson & Ouchi 1981, p. 352). Once asset-specific investments have been made, neither buyer nor seller can turn to the market as a viable alternative, and it becomes particularly important to safeguard transactions involving asset specificity against the (costly) hazards of opportunism.

In Williamson's view, it is the job of the firm (or more generally, of governance structures) to economize on transaction costs. The firm's system of authority relations is crucial in this regard (Williamson 1988, 1991), for when transactions are internalized within a firm, opportunism can be reduced through the exercise of fiat. TCE uses the same general framework to explain vertical integration, the creation of the multidivisional form and other hierarchies, the emergence of conglomerates, and the separation of ownership and control in large firms (1975, 1985). Recently, Williamson has tried to explain more complex forms of contracting such as strategic alliances, networks, and cross-ownership patterns that appear in corporations across the world, arguing that such forms of contracting economize on transaction costs where there is genuine interdependence between organizations but not enough to merit full-scale merger (Williamson 1991).

Agency theory views all social relations in economic interaction as reducible to a set of contracts between principals and agents. Principals are individuals who select agents to do their bidding in some matter. The key problem is aligning the interests of the agent such that they do not act against the interests of the principal. This requires writing a contract (sometimes explicitly, sometimes implicitly) that provides safeguards for both the principal and the agent. Such contracts must provide principals with a way to monitor agents, and they must create incentives for each side to carry out its part of the bargain (Jensen & Meckling 1974).

In agency theory, the firm is seen as a fictitious entity created by a "nexus of contracts" of the principal-agent variety. In this respect the firm is no different than the market: it "has no power of fiat, no authority, no disciplinary action any different in the slightest degree from ordinary market contracting between two people" (Alchian & Demsetz 1972:119). Instead, the firm is a system of property rights that defines a set of principal-agent relations and divides up claims to assets and residual cash flow (Fama & Jensen 1983a,b). The principal, an owner, hires employees to do part of the work. They are paid a wage and in exchange usually, though not always, relinquish claims on the profits. The contract to which they agree contains specifications of their duties, their rewards, and the rights of the principal to monitor their performance.

Agency theory argues that different divisions of property rights—the joint stock company, partnerships, sole proprietorships, nonprofit organizations—arise because these forms of organization are efficient under specific conditions. Basically, depending on the severity of agency costs (i.e. the costs of structuring, bonding, and monitoring a set of contracts among agents with conflicting interests), an alternative division of property rights makes sense (Fama & Jensen 1983b). For example, the joint stock corporation under management control is likely to thrive when the cost of setting up the firm is prohibitively high, the type of knowledge necessary to manage the firm is specialized, there are large economies of scale, and there are persons willing to supply capital on the hope of obtaining residual claims that are already discounted for agency costs (Fama & Jensen 1983a). Under these circumstances, the classic separation of ownership and control occurs. But according to agency theory, this arrangement does not lead to inefficiency. Instead, ownership and management interests are aligned through three mechanisms. First, managerial pay is linked to firm performance; second, boards of directors monitor managerial action; third, the market for corporate control effectively sanctions managers who misuse financial assets, even if boards of directors have been co-opted. In this account, the firm is efficient, even if product markets are not. Versions of this perspective have been used extensively in a wide variety of applications including finance economics (Ross 1977, Myers 1984, Fama 1980, Jensen & Meckling 1974).

Neo-institutionalist accounts usually retain the assumption that observed markets are either in or approaching some form of equilibrium. A more radical perspective on this issue is taken by what we label "neo-evolutionary" theory in economics. Brian Arthur (1988, 1989) argues that economic institutions may have random starts. Thus, history and accident will play some role in the origins of economic modes of organizing. At these originating moments, there may be several ways to organize production, none of which have any obvious advantages. Arthur has argued that during the dynamic processes whereby markets are built, one or another form of organization may have some slight advantage. Over time, institutions grow up around a certain organization, and they tend to reinforce that organization's advantage.

Arthur terms this process a "lock-in." The process by which this lock-in occurs is a set of tiny, discrete steps that over time institutionally embed a given set of arrangements. Once in place, they become difficult to dislodge. Economic processes are thus dynamic up to a point, but once a lock-in occurs around a particular form of organization, markets become stable and less dynamic. Market processes that evolve in this fashion are termed "path dependent." Arthur has studied a number of processes with this model including the introduction of new technology, the location of urban agglomerations, and the creation of technological centers such as Silicon Valley in California and Route 128 in Boston (1988, 1989).

His model helps explain why the entry into modernity has such a profound effect on the structure of a national economy. The historical entry into industrialization is characterized by the simultaneous formation of a large number of institutional arrangements. Once these arrangements are in place, they form institutional conditions that help organize how new organizations and industries will emerge. This approach implies that property rights may be organized in a number of different ways, but once organized, they will tend to be stable and provide institutional structure to new industries that emerge.

A different view of economic dynamics comes from Nelson & Winter (1982). They argue that markets are continuously dynamic and never reach equilibrium points. This means that firms are constantly being confronted by unstable market conditions. In response, firms attempt to find ways of reproducing themselves over time. They do so by creating competencies that embed organizational procedures. The standard operating procedures of a firm both produce products and also serve to monitor problems. They provide feedback to decision makers about changing conditions internal or external to the firm.

In this elegant way, Nelson & Winter are able to combine March & Simon's view of organizations with a dynamic view of market processes. Firms that do not develop such competencies go out of business, while firms that do can prosper for relatively long periods of time. However, market processes can occasionally overwhelm even the most stable firms. This perspective does not explain which competencies will emerge from the formation of markets. However, it does suggest that once they emerge, they tend toward reproduction precisely because they have reliably led to reproduction in the past. Nelson & Winter provide another argument for why one might expect distinct organizational styles across markets and societies. A set of arrangements, once in place, will resist transformation because the owners and managers of firms will stick to procedures that have brought them success in the past.

SOCIOLOGICAL THEORIES OF CONTROL

Sociological approaches to the firm can be seen as a progression away from efficiency principles and toward a more diffuse set of political and cultural explanations, although this is by no means universally the case. In this section, we consider four general sociological approaches that are relevant to comparisons of corporate organization: resource dependence (Burt 1983, Pfeffer & Salancik 1978, Gerlach 1992), network approaches that focus on governance arrangements to increase organizational competitiveness (Powell & Smith-Doerr 1994, Piore & Sabel 1984, Powell & Brantley 1992, Saxenian 1994), political approaches (Campbell & Lindberg 1990, Fligstein 1990, Hamilton & Biggart, 1988, Mintz & Schwartz 1985, Mizruchi & Stearns 1988, Westney 1987), and institutional accounts (DiMaggio & Powell 1983, 1991; Meyer & Rowan 1977; Scott & Meyer 1994).

Sociologists tend to shy away from making claims that an organizational form is efficient in a neoclassical sense. Instead, organizational theory assumes only that organizational forms are effective, i.e. that they promote the survival of the organization. The "effectiveness" assumption suggests that while these approaches use very different rhetoric to describe their objects, there turns out to be a surprising degree of congruence on the important sociological mechanisms that structure organizational life. Power within and across firms, states, resource dependence, and the construction of institutions are the basic elements of sociological theorizing about the firm.

The strategic contingencies perspective on organizations dominated sociological accounts in the 1960s and early 1970s (Thompson 1967, Lawrence & Lorsch 1967). This approach drew heavily on the work of Herbert Simon and the Carnegie School, and it retained much of the economic focus on markets and rational adaptation to market conditions. Strategic contingencies accounts held that managers and owners of firms were constantly surveying their environments, interpreting "strategic contingencies" that would affect the chances of corporate survival. Having perceived such contingencies, they would alter the firm's internal strategies and structures in order to adapt to environmental conditions. The basic model was that rational actors could perceive the shifting tides of their external worlds and would have the power to act to preserve their organizations.

Much of the sociological work on organizations since the mid-1970s has been a response to the rational adaptation approach embedded in the strategic contingencies model. The criticisms go in several directions. Many scholars have argued that the strategic contingencies model focuses too heavily on rational adaptation. They retain the belief that environments are powerful determinants of organizational life chances, but they contend that neither the identification of environmental shifts nor subsequent organizational changes are as easy as strategic contingency theory suggests (Hannan & Freeman 1977, 1984; Pfeffer & Salanacik 1978; Meyer & Rowan 1977). A second group of researchers argues that environments are themselves social and political constructions and that the processes by which they are created are themselves an object of study (Fligstein 1990; DiMaggio 1985, 1989; Pfeffer 1981; Orru et al 1991:361).

Scholars concerned with environments have continued to focus on organizational survival as a response to environmental change. Most of these views rely implicitly or explicitly on some form of resource dependence perspective. There are two sorts of views of resource dependence, one that focuses on the management of dependence and the other that argues that environmental dependence is the key to survival.

The former variant of this theory argues that actors' power within the organization depends on their ability to control and solve internal and external resource dependencies (Pfeffer & Salancik 1978). This ability can derive from actors' positions within the firm, their specialized knowledge, or their links to the outside world. If there is a shift in resource dependencies, there is the potential for a shift in the balance of power. Thus powerful actors will resist change in an attempt to protect their positions, while less powerful actors will attempt to introduce only those changes that increase their power (Fligstein 1985, 1987).

Burt has used such resource dependence arguments to model network connections between firms and industrial sectors in the US economy. His key point is that the network links between key suppliers and customers affect their profitability (1983). If there are a large number of suppliers and few customers, then the advantage will shift to the customer. If the opposite situation occurs, the advantage will be with the supplier. Such asymmetries should in theory produce higher than average profits for the firm with resource advantages. They might also make the firm with resource disadvantages unstable. Burt has

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argued that using boards of directors as connectors between suppliers and customers is one way to manage and index these types of resource dependence. Other analysts have used a similar approach in examining networks of connections between owners, managers, and banks, arguing that the patterns of interaction among these actors shape the possibilities for firm behavior (Mizruchi & Schwartz 1988, Mintz & Schwartz 1985, Mizruchi & Stearns 1988).

A second branch of resource dependence theory has retained a greater emphasis on market selection and efficiency principles. This approach posits that the market selection occurs at the population level, where organizations survive due to their ability to function under given environmental conditions (Hannan & Freeman 1977, 1984). Once organizational forms appropriate to a given environment have been selected, structural inertia sets in, making further change difficult. In such accounts, resource dependencies are often so severe as to affect the survival odds of a given organization. Ecological analysis that focuses exclusively on selection processes is an extreme form of environmental determinism that has resource dependence at its core.

Other network approaches have been developed which stress how cooperation between competitors and suppliers can lead to positive outcomes for firms (Powell 1990). Implicitly, most of these approaches adopt a kind of strategic contingencies view of how networks are responses to organizational environments. These approaches posit a set of rather heterogeneous mechanisms which focus on how qualities of the environment make network forms of organization attractive (see Powell & Smith-Doerr for a review). Networks based in regions such as Silicon Valley utilize flexible specialization and are based on norms of reciprocity (Saxenian, 1994). The networks here are effective because firms can easily gain access to goods and services they might need to compete in a rapidly changing market environment.

In industries, such as biotechnology, where innovation and learning are critical, there exists a common technological community, which works best by a constant exchange of ideas and persons (Powell & Brantley 1992). Business groups, such as the Japanese *kerietsu*, appear to be authority structures that coordinate firm activities based on common business ownership (Gerlach 1992). Finally, strategic alliances and joint ventures are formed for common gain between firms (Piore & Sabel 1984). Most relevant for the review here, is the idea that firm competition and cooperation can be structured very differently depending on the nature of the environment.

Critiques of resource dependence approaches have noted that there is an element of social construction involved in what constitutes resource dependence. Pfeffer (1981) has made a compelling case that while there are certainly situations where resource dependence is pivotal for organizational life chances, it is also the fact that actors must interpret their interdependencies and have the power to act. In murky social worlds, perceiving interdependencies is not always a straightforward task. Moreover, even if this occurs, actors must be able to impose their interpretation of the strategic contingency at stake on others. Once it is acknowledged that this is the case, it becomes apparent that perceptions of interdependence may be as important as interdependencies themselves.

Political theories of the firm pursue the notion that resource dependence is socially constructed, thus supplementing the focus on technical environments with a focus on institutional environments. Fligstein has termed this a political-cultural approach (Fligstein 1990, Fligstein & Brantley 1992). He argues that the basic problem facing organizational actors is to create a stable world so that the organization can continue to exist. This necessitates the construction of an organizational field in which actors come to recognize and take into account their mutual interdependence. Fligstein argues that these understandings are reached through political processes. Generally, the largest groups develop a collective way to control the organizational field, and they impose it on the smaller groups. There are two problems involved in creating a stable organizational field: finding a set of understandings that allow a political accommodation in the field, and the legitimation of those understandings by a government. Fligstein (1990: Ch. 1) calls such a set of understandings a conception of control.

From this perspective, states are implicated in all features of organizational life. The organizations and institutions of the state make and administer the rules governing economic interaction in a given geographic area, and they are prepared to enforce those rules, in the last instance through force. The state's claim to set the rules for economic interaction is social in origin, and as such it is contestable. The process by which these rules are set up, transformed, and enforced is therefore an inherently political process. It follows from this that the local politics and existing practices of nations will have profound effects on the form, content, and enforcement rules in organizational fields (for a similar approach, see Dobbin 1994). The formation of organizational fields will depend on the politics in the field and the relation between the field and the state.

A similar approach is outlined by Campbell & Lindberg (1990), who argue that the state shapes the institutional organization of the economy mainly through the manipulation of property rights. It does so in response to pressures from economic actors, but also as a result of political choices made by actors in the state. Campbell & Lindberg define governance structures as "combinations of specific organizational forms, including markets, corporate hierarchies, associations, and networks (e.g. interlocking directorates, long-term subcontracting agreements, bilateral and multilateral joint ventures, pools, cartels)" (1990:3), while they see property rights as "the rules that determine the conditions of ownership and control over the means of production" (1988:2). Their basic assertion is that state actors manipulate property rights to help ratify or select certain governance structures. Using evidence from seven major US industries, they argue that the American state has actually had a very powerful role in the American economy by approving or disapproving of varying arrangements (Campbell et al 1991).

Institutional theories (DiMaggio & Powell 1983, DiMaggio 1989, Meyer & Rowan 1977, Scott & Meyer 1994, Zucker 1977, 1987, 1988) complete the conceptual transition away from technical environments, focusing almost exclusively on "the socially constructed normative worlds in which organizations exist" (Orru et al 1991:361). As firms interact with each other and with their environments, formal or informal rules emerge to govern interaction, and organizational fields are formed. Once these fields become institutionalized, however, they take on an independent status that has a powerful normative effect on subsequent interaction. Once socially defined institutional environments are in place, changes in organizational form are driven more by considerations of legitimacy than by concern for rational adaptation or efficiency.

The recent Scott & Meyer volume (1994) contains a set of interesting empirical studies that illustrate these points. Two sorts of processes are illustrated in these studies. First, the construction of meanings and the role of organized groups such as firms and states is usefully elucidated. Second, much of the work concerns the diffusion of shared meanings. Once institutions are invented, they spread, often with remarkable speed, across settings.

Institutional theory has not directly focused on the questions of ownership and control, firm cooperation and competition, and firm strategy and structure. It would suggest, however, that once a set of institutions around these issues were in place, they would be very difficult to dislodge. Further, new organizational innovations would tend to spread to organizational fields that were close together, while more distal fields would be late adopters. Institutional theory would tend to support other theoretical views that unique institutions might evolve across societies and that they would create stable patterns of difference impervious to market interactions.

COMPARATIVE CASES

In this section we examine how firms and economic transactions are organized across a number of societies in order to assess how well various theories of corporate organization can account for these differences. While we attempt to focus on evidence concerning the organization of property rights, competitive and cooperative arrangements, and firm strategies of vertical integration and diversification, there are several problems involved in reviewing the comparative literature. First, the evidence that is available is often selective rather than comprehensive, since analysts have tended to look at variables that reflect their own perspective and have not tried to partition variance among a number of perspectives. In trying to get a coherent view of what we know about any national capitalism, one is left with a selective review that focuses on the variables that theorists have sought out. Second, most of the work on comparative organizations has been done in advanced industrial societies. We know quite a bit about business organization in the US, Western Europe, and Japan, but we know less about the other countries of Asia and Eastern Europe, and much less about the rest of the world. This review considers the United States, Japan, Germany, France, and more briefly, Taiwan, and Korea. This huge set of comparisons are done relatively superficially, primarily to illustrate the value of the theories.

It is useful to put the conclusions up front. Despite all of the discussion of globalization of the world economy and the so-called multinationalization of corporations, different societies continue to have distinctive organizational arrangements. These arrangements are primarily the function of three factors: the unique history of each society's entry into industrialization and its subsequent institutional development, the unique form of state intervention into economies in terms of property rights and rules of competition and cooperation, and the social organization of elites (i.e. whether families, managers, or states who own or exert control over corporations). The theories that appear to capture these dynamics most adequately are neo-evolutionary perspectives in economics and political-institutional approaches in sociology.

Resource dependence theory plausibly accounts for some of what is observed. Firm alliances, networks, family ownership patterns, and interlocking directorates are phenomena that appear to differing degrees across industries and societies. One could posit that these different arrangements reflect unique resource dependencies, but the evidence has not been gathered to prove that and the assertion might be tautological. There is little support for agency theory as an explanation for variation across societies. While agency theory would predict that property rights would converge around a single model, many societies with similar types of agency problems have very different property rights arrangements. It is possible to construct transaction cost arguments for the differences across societies, but the evidence, like that for resource dependence, is difficult to assemble (see Aoki 1988 for an attempt to do so in the case of Japan).

We begin with a consideration of the US case. Agency theory and its employment by finance economists have shaped the way we talk about the corporation, and the large American industrial corporation is discussed today primarily in financial terms. For financial economics, the assets, debts, and free cash flow relative to the numbers of shares of stock and the current stock market evaluation of each share together sum up all that is important to know about any given firm. Managers and owners of firms have come to view their organizations in the same way (Useem 1993). Operating divisions are bought and sold based on their short-term financial performance. Workers are fired to improve next quarter's profits, and those who are left are supposed to carry the burden by increasing their productivity.

How did this conception of the firm arise and come to dominate corporate organization in the United States? A resource dependence perspective would predict that powerful actors controlling critical resources constructed this conception of the firm for their own benefit. A huge amount of intellectual energy has gone into ascertaining the relationship between who owns corporations and who controls them (Kotz 1978, Larner 1971, Herman 1980, Mintz & Schwartz 1985). An equal amount of energy has gone into mapping the connections between banks, insurance companies, and cross-ownership patterns in American corporations, mainly through the use of interlocking directorships (for example, Mizruchi & Schwartz 1988). While there appears to be a fair amount of interlocking, it is unstable (Mizruchi 1982, Palmer 1983) and its effects have been inconsistent across studies (Burt 1983; for a review, see Fligstein & Brantley 1992). It is hard to argue that the finance conception of the firm originated in these patterns of relations.

Another possible origin of the financial conception of control is the dominance of financial markets. While financial markets and investment houses (particularly, JP Morgan) played a key role in the turn-of-the-century merger movement in the United States (Mizruchi 1982), there is little systematic evidence that these financial institutions, particularly investment bankers and institutional investors (defined as pension funds, insurance companies, or mutual funds), played active roles in the shaping of corporate strategies and structures from 1905 until 1980 (Fligstein 1990, Fligstein & Brantley 1992). This was primarily because US antitrust laws—in particular the Clayton Act, but also the Glass-Steagall Act—made interlocks between competing industrial firms illegal and bank ownership of firms problematic. US firms were not allowed to exhibit the financial linkages and ownership patterns that emerged in Europe and Asia. Instead, the proximate causes of the behavior of large American industrial corporations are better viewed in the context of the organizational fields in which they found themselves.

There were two conditions that produced the finance conception of control in the postwar era. First, large firms in the postwar era were already fairly diversified. The problem of internally controlling a large number of products opened an opportunity for executives who could claim to evaluate the profit potential of each product. To make the large, diversified corporation manageable, finance executives reduced the information problem to a measurement of the rate of return earned by each product line. Second, the federal government was strictly enforcing the antitrust laws in the early postwar era and had passed an antimerger law that made it difficult to merge with direct competitors or suppliers. This encouraged firms to diversify in order to grow. The financial executives who could evaluate profit potential for product lines outside of a firm's area of expertise were invaluable in such efforts (Fligstein 1990: Ch. 6).

The factor that solidified the finance conception of control was the challenge to firms in established organizational fields that came from corporate invaders. The men who pioneered the acquisitive conglomerates showed how financial machinations involving debt could be used to produce rapid growth with little investment of capital. All of the financial forms of reorganization including mergers, divestitures, leveraged buyouts, the accumulation of debt, and stock repurchasing were invented or perfected in this period. The 1960s witnessed a large-scale merger movement in which many of the largest corporations substantially increased their size and diversification. Managers and owners of industrial corporations who were not active participants in the 1960s merger movement were likely to become targets from other industrial corporations in that movement (Palmer et al 1995). As a result of this, finance executives increasingly became CEOs, and the finance conception of the corporation invaded most of the organizational fields of the largest American corporations (Fligstein 1987).

The finance conception of control that emerged in the 1960s was further solidified by the merger movement of the 1980s. Friedman (1985) has argued that the proximate cause of the 1980s merger movement was the state of the balance sheets of American corporations around 1980. The 1970s were an era of high inflation, high interest rates, and a poor stock market. By 1980, many firms found themselves with undervalued assets on their books—assets that had risen in value because of inflation and relatively low stock prices.

Another factor behind the merger movement of the 1980s was state intervention that created changes in the regulatory environment. The Reagan administration weakened antitrust laws in the 1980s by lifting many existing restrictions, giving the green light to all types of mergers, including vertical, horizontal, and conglomerate forms. At the same time, they substantially reduced corporate taxes, thereby providing capital for the merger movement. These actions, when combined with the finance conception of control that had arisen in the 1960s and the undervalued corporate assets of the 1970s, led to an explosion of merger activity.

Although the mergers of the 1980s were sometimes implemented by management, they helped to strengthen the power of financial markets over the industrial organization. Firms with a finance-oriented CEO were more likely to engage in financial reorganization; conversely, firms without a finance CEO were more likely to become merger targets (Fligstein & Markowitz 1993, Davis & Stout 1992). Nonetheless, institutional investors and investment bankers played key roles, strengthening the role of financial markets. They recognized that firms had undervalued assets that could be sold off for huge profits or leveraged for new asset purchases; they created the "junk bond" market which provided a market to borrow huge sums of other people's money to engage in obtaining assets; and they used the finance conception of control to force managers to reorganize firms financially or risk becoming victims of the market for corporate control (Davis & Stout 1992, Davis & Thompson 1994). As a result, the 1980s witnessed an increase in shareholder activism (Useem 1993), particularly among large, institutional shareholders (Baums et al 1994: Part 2).

The growth of financial control does not appear to have had a significant impact on corporate strategies regarding competition in product markets. While there is some evidence that research and development expenses are pared when large mergers occur (Graves 1988), there is no systematic evidence that so-called active financial intervention by institutional investors or investment bankers changes strategies in any important way (although there is evidence that the number of products produced by the largest firms decreased in the 1980s—Davis et al 1994). The strongest predictors of such behavior continue to be the primary markets in which firms operate and the strategies and structures of those whom they perceive to be their main competitors (Fligstein & Brantley 1992). American firms tend to be large, diversified, and run by financial criteria.

This is not surprising. An institutional investor in the semiconductor industry, for example, would not try to dictate how frequently managers produced a new generation of computer chips. To protect their investment, they would have to know that the industry basically has short product cycles (2–4 years). Opposing a new generation of computer chips would make their investment worthless. There is, however, an important caveat. The principal actors in financial markets have forced managers of large industrial corporations to increasingly emphasize short-term profits. It remains to be seen how this will affect corporate strategies in the future.

The conception of finance control that has arisen in the United States has not emerged in many other advanced capitalist countries (with perhaps the exception of Great Britain), in large part because of state and elite resistance. For example, the European Union has decided to allow member states to continue to monitor mergers and decide if a given merger is in the interest of the member state. There will be no European market for corporate control in the Single Market (European Community 1985).

State-firm relations around western Europe remain remarkably stable. The French government continues to control a large number of large French firms (Annastassopoulos et al 1987) in spite of some recent privatizations. The basic French industrial policy has attempted to create "national champions" who could compete on world markets (Dyas & Thanheiser 1976). These champions were supposed to be large enough to attain economies of scale. The French government controls investment in these firms and the direction of capital toward those firms (Jenny & Weber 1980). Indeed, the government has induced mergers in given industries as part of its industrial policy.

French industrial policy has not wavered throughout the 1980s. Indeed, large French firms took advantage of the American and British markets for corporate control to purchase stakes in large firms in both of those countries. Because French industrial policy focused on creating firms that were supposed to attain economies of scale, large French firms tend to be vertically integrated, relatively large, and undiversified in their products (Dyas & Thanheiser 1976, Green 1986). Government intervention into financial markets and government ownership of firms has meant that alliance capitalism does not exist. Government intervention has also been an impediment to a market for corporate control.

German firms have less direct federal intervention. However, the German Lander (the equivalent of states in the United States) continue to have substantial ownership stakes in important industrial firms. They use these stakes to affect investment patterns of local firms in order to preserve their industrial base (Stokman et al 1985). Historically, cartels were legal in Germany. This led to cooperative behavior among German producers (Dyas & Thanheiser 1976, Kocka 1980). Today, while cartels are illegal, German antitrust law allows firms in the same industry to cooperate when their products are intended for export. German firms thus have less incentive to merge to control competition and a great deal of incentive to cooperate.

The largest German firms are conglomerates, usually centered around a bank (Lane 1989). These can resemble the *keiretsu* structure of Japanese firms. Stock is held closely by families and banks, and investment is usually directed from banks (Kocka 1980, Stokman et al 1985). There are very few assets for sale in Germany in the stock market, and those markets are relatively unimportant. The core of the German economy, the so-called *Mittlestandt*, are relatively small firms that specialize in a small set of products (Cable et al 1980). These firms, typically with sales in the range of $80–$100 million, are generally family owned and controlled. They are often passed down the generations. These firms concentrate on upscale production markets for industrial goods. As a result of close holding of ownership and a lack of incentives to control competition through mergers, German firms are less integrated, smaller, and less diversified than their American counterparts.

The Japanese case has been widely studied (Ableggen & Stalk 1985, Aoki 1988, Gerlach 1992, Hadley 1970, Kono 1984, Whitley 1992, Lincoln et al 1992). The general conclusion is that the core of the Japanese industrial economy is organized into enterprise groups. Most of these groups existed before the Second World War as family-owned federations of firms called *zaibatsu.* After the War, they were reorganized into looser groups that are called *keiretsu* (Yoshino 1967). The stock ownership patterns are such that each firm owns a small part of the stock of the other firms (Lincoln et al 1992). The group is usually in a large number of industries, and at the core of the group is often a bank. Very few shares of the firm trade on open equity markets. Since investment is internally generated, it is usually oriented to long-run gains and holding market share (for a review of this literature, see Gerlach 1992: Ch. 3).

The Japanese government has also played an active role in investment patterns in the economy, at least historically (Westney 1987, Johnson 1982). The Japanese government directed the original entry into industrialization during the Meiji Restoration. They explicitly borrowed western models of institutions in order to move rapidly into industrial development (Westney 1987). During the postwar era, the Ministry of International Trade and Industry promoted Japanese industry in a variety of ways. Firms were encouraged to enter export markets, and credit was allocated to projects that would produce goods for export (Johnson 1982). The *keiretsu* structure was reinforced and used to support export activity.

There has been much discussion about whether or not the Japanese stock market will be effective in breaking up these arrangements. After nearly a decade of such discussion, one can only observe that the *keiretsu* structure remains in place. There is no market for corporate control in Japan, and there is not likely to be one. Gerlach (1992) shows that historical patterns of trading, credit, and ownership were stable in the *keiretsu* during the late 1980s.

Taiwan and South Korea exhibit alternative structures (Hamilton & Biggart 1988, Whitley 1990). In Taiwan, large industrial firms are family owned and controlled. Most firms are relatively small. When firms start to get larger, families usually set up new firms to produce related products. Funding for these new firms comes from the earnings of the old firms. Control remains firmly in the hands of families, and the equity markets play little role in the generation of new firms and capital (Hamilton & Kao 1990). The Taiwanese government has also played very little role in the allocation of capital. The rapid development of that economy has been done primarily by private hands without the intervention of either financial markets or government. Taiwanese firms do not tend to be large, vertically integrated, or diversified. The connections between firms mainly revolve around extensive kinship networks. Taiwanese business is the purest case of small-scale firms that are family controlled and densely networked.

The core of the Korean economy is dominated by a set of large conglomerate corporations. The Korean word *chaebol* is a direct translation of the Japanese word *keiretsu* (Hamilton & Biggart 1988). The *chaebol* differ from the *keiretsu* in two principal ways. Unlike the *keiretsu*, the *chaebol* are highly diversified family-owned firms. They are very highly integrated, and ownership and investment is centrally directed (Whitley 1990).

The Korean government also plays a large and active role in the investment patterns of the *chaebol*. This dates throughout the postwar era and is a direct result of the Korean War. Indeed, government control is stronger in Korea than in any of the emerging capitalist countries in Asia. As a result, private financial markets play almost no role in the growth of the economy (Hamilton & Biggart 1988, Whitley 1992). As already suggested, Korean firms are large, integrated, and diversified, yet under the control of a small number of families with strong ties to government.

CONCLUSIONS

There is no evidence that the world is converging on a single form of state–finance sector–industrial corporation relations. Families, managers, and states alternate in their domination of ownership in various societies. There is also little evidence that relations between firms are converging toward markets, hierarchies, networks, or strategic alliances as the dominant form of governance; stable situations with different configurations abound across various societies. Large firms in different societies also differ in their product mix and integration. Finally, the types and degree of state involvement in markets varies widely within and across regions. The total effect is still one of national capitalism.

Available evidence suggests that there will be no world market for corporate control. Property rights and governance structures are under the control of nation-states and local elites. As long as states claim sovereignty, they are unlikely to undermine their control over their economies in this way. Moreover, their local elites also have a great deal to lose from current arrangements, and they will oppose actions that would force conformity to someone else's standards. Even our scant review of state–firm–financial sector relations shows that while American, Japanese, and some European corporations are dominated by managers, the core of much of the rest of the world's economy is controlled by families (see Hamilton & Kao 1990 for Taiwan, Evans 1979 for Brazil, Leff 1978 for a review of other third world countries including Mexico).

While the American industrial structure is firmly in the grasp of the finance conception of control, the rest of the world has steadfastly resisted importing such a notion of governance for the reasons just outlined. National economies have distinct institutional arrangements that outline the relation between investment, ownership, control, and economic growth. While they are interested in world trade, they are set up to preserve their national systems of property rights and governance structures.

These results present several interesting theoretical and empirical agendas. Theoretically, there has been a tendency for competing explanations of governance to be posed in oppositional terms. Organizational form is thus understood as a matter of, for example, efficiency versus legitimacy. Our review of the literature suggests that the relationship between causal mechanisms is more complicated. Economic approaches, for instance, have implicitly assumed that social structure will change to create efficiency when exchange is carried out across societal boundaries. Our review suggests that different societies define property rights and the rules of competition and cooperation in different ways. These unique specifications of the noncontractual elements of contract lead to different types of interdependencies and different ways of managing or resolving those problems. Efficiency is socially constructed rather than market constructed (Fligstein 1990: Ch. 9), and there may be many ways to organize "efficiently".

Yet this should not be taken to mean that "everything is legitimacy" or that "everything is power." Although socially constructed, market forces continue to pose important constraints on organizations. A focus on institutional environments and states should not be used to supplant an analysis of technical environments. Rather, the point should be to investigate the ways in which social and economic imperatives reinforce and contradict one another (Orru et al 1991). The most fruitful approaches thus far have been those that emphasize the ways in which history and social relations shape both institutional and economic relations.

Unfortunately, these theories have tended to be weak analytically. So, for instance, we have lots of evidence about the existence of multiple organizational forms, but few theories about the reasons for the existence of the variability. It is thus important that economic sociology continues to develop testable theories that explore the relationship between technical and institutional factors (for an important attempt to begin to classify business groups, see Granovetter 1994).

Finally, our review highlights the fact that theories of organization have rarely been tested across societies. Most have arisen to explain a specific aspect of governance, and they have focused on a narrow range of cases. This is most often a function of the academic division of labor. Scholars interested in a particular society are often not particularly knowledgeable about other societies. Moreover, empirical work usually focuses only on the variables identified by a particular theoretical approach. Consequently, it is difficult to assemble a balanced view of organizations across a number of societies, and it is difficult to state conclusions with certainty. It is thus important that organization theory begin to carry out more systematic comparative analyses across different societies.

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Literature Cited

Ableggen J, Stalk G Jr. 1985. *Kaisha: The Japanese Corporation*. New York: Basic

Alchian AA, Demetz H. 1972. Production, information costs, and economic organization. *Am. Econ. Rev.* 62:777–95

Annastassopoulos JP, Blanc G, Dussauge P. 1987. *State Owned Multinationals*. New York: Wiley

Aoki M. 1988. *Information, Incentives and Bargaining in the Japanese Economy*. Cambridge, Eng.: Cambridge Univ Press

Arthur B. 1988. Self reinforcing mechanisms in economics. In *The Economy as an Evolving Complex System*, ed. P Anderson. Reading, MA: Addison-Wesley

Arthur B. 1989. Competing technologies and lock-in by historical events: the dynamics of allocation under increasing returns. *Econ. J.* 99:116–31

Baumol WJ. 1959. *Business Behavior, Value, and Growth*. New York: Macmillan

Baums T, Buxbaum R, Hopt K, eds 1994 *Institutional Investors and Corporate Governance*. New York: Walter de Gruyter

Berle AA, Means GC. 1965. *The Modern Corporation and Private Property*. New York: Macmillan

Burt R. 1983. *Corporate Profits and Cooptation*. New York: Academic

Cable JR, Palfrey PR, Runge JW. 1980. Federal Republic of Germany, 1962–74. In *The Determinants and Effects of Mergers*, ed. D Mueller. Cambridge, MA: Oelgescher, Gunn, & Hain

Campbell J, Hollingsworth JR, Lindberg L. 1991. *Governance of the American Economy*. New York: Cambridge Univ. Press

Campbell J, Lindberg L. 1990 Property rights and the organization of economic activity by the state. *Am Sociol Rev.* 55:3–14

Caves R. 1980. *Structure, Conduct, and Performance* New York: Harper & Row

Chandler A. 1962. *Strategy and Structure*. Cambridge, MA: MIT Press

Chandler A. 1990. *Scale and Scope*. Cambridge, MA: Harvard Univ. Press

Coase R. 1937. The nature of the firm. *Economica* 4:386–405

Davis G, Diekmann K, Tinsley C. 1994. The deinstitutionalization of conglomerate firms in the 1980s. *Am. Sociol. Rev.* 59:547–70

Davis G, Stout S. 1992 Organization theory and the market for corporate control: a dynamic analysis of the characteristics of large takeover targets, 1980–1990. *Admin. Sci. Q.* 37:605–33

Davis G, Thompson T. 1994 A social movement perspective on corporate control. *Admin. Sci. Q* 39.141–73

DiMaggio P. 1985. Structural analysis of organizational fields. *Res. Organ. Behav.* 7: 335–70

DiMaggio P. 1989. Interest and agency in institutional theory. In *Research on Institutional Patterns: Environment and Culture*, ed. L Zucker. Cambridge, MA: Ballinger

DiMaggio P, Powell WW. 1983. The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. *Am. Sociol. Rev.* 48:147–60

DiMaggio P, Powell WW. 1991. Introduction. In *The New Institutionalism In Organizational Theory*, ed. P DiMaggio, W Powell. Chicago: Univ Chicago Press

Dobbin F. 1994. *Forging Industrial policy*. Princeton, NJ: Princeton Univ. Press

Dyas GP, Thanheiser HT. 1976. *The Emerging European Enterprise*. London: MacMillan

European Community. 1985. *Completing the Internal Market*. Luxembourg Off. Official Publ. Eur. Community

Evans P. 1979. *Dependent Development: The Alliance of Multinational, State, and Local Capital in Brazil*. Princeton, NJ: Princeton Univ. Press

Fama E. 1980. Agency problems and the theory of the firm. *J. Polit. Econ.* 88:288–307

Fama E, Jensen M. 1983a. Separation of ownership and control. *J. Law Econ.* 26:301–26

Fama E, Jensen M. 1983b. Agency problems and residual claims. *J. Law Econ* 26:327–50

Fligstein N. 1985. The spread of the multidivisional form. *Am. Sociol. Rev.* 50.377–91

Fligstein N. 1987. The intraorganizational power struggle: the rise of finance presidents in large corporations. *Am. Sociol. Rev.* 52: 44–58

Fligstein N. 1990. *The Transformation of Cor-*

porate Control. Cambridge, MA: Harvard Univ. Press

Fligstein N, Brantley P. 1992. Bank control, owner control or organizational dynamics: who controls the modern corporation. *Am. J. Sociol.* 98:280–307

Fligstein N, Mara-Drita I. 1993. *How to make a market: The European Community's Single Market Program.* Pap. pres. Annu. Meet. Am. Sociol. Assoc., Aug., 1993, Miami, FL

Fligstein N, Markowitz L. 1993. The finance conception of the corporation and the causes of the financial reorganization of large American corporations, 1979–1988. In *Sociology and Social Policy*, ed. WJ Wilson. Beverly Hills, CA: Sage

Freeland R. 1994. *The struggle for control of the modern corporation: organizational change at General Motors, 1924–1958.* PhD thesis. Univ. Calif., Berkeley

Friedman B. 1985. The substitutability of debt and equity structures. In *Corporate Capital Structures in the United States*, ed. B Friedman. Chicago, IL: Univ. Chicago Press

Gerlach M. 1992. *Alliance Capitalism.* Los Angeles: Univ. Calif. Press

Granovetter M. 1994. Business groups. In *The Handbook of Economic Sociology*, ed. Neil Smelser, Richard Swedberg, pp. 453–75. New York: Russell Sage

Graves S. 1988. Institutional ownership and corporate R & D in the computer industry. *Acad. Manage. Rev.* 31:417–28

Green D. 1986. The state, finance, and industry of France. In *State, Finance, and Industry: A Comparative Analysis of Postwar Trends in Six Advanced Industrial Countries*, ed. A Cox. New York: St. Martin's

Hadley E. 1970. *Antitrust in Japan.* Princeton, NJ: Princeton Univ. Press

Hamilton G, Biggart N. 1988. Market culture and authority: a comparative analysis of management and organization in the Far East. *Am. J. Sociol.* 94:S52–94

Hamilton G, Kao CS. 1990. The institutional foundation of Chinese business: the family firm in Taiwan. *Compar. Soc. Res.* 12:95–112

Hannan J, Freeman J. 1977. The population ecology of organizations. *Am. J. Sociol.* 82: 929–66

Hannan J, Freeman J. 1984. Structural inertia and organizational change. *Am. Sociol. Rev.* 49:149–64

Herman E. 1980. *Corporate Power, Corporate Control.* New York: Free

Jenny F, Weber AP. 1980. France, 1962–72. In *The Determinants and Effects of Mergers*, ed. D Mueller. Cambridge, MA: Oelgeschlager, Gunn, & Hain

Jensen M. 1989. Eclipse of the public corporation. *Harvard Bus. Rev.* 61–73

Jensen M, Meckling P. 1974. Theory of the firm: managerial behavior, agency costs, and ownership structure. *J. Finan. Econ.* 3:305–360

Johnson C. 1982. *MITI and the Japanese Miracle.* Stanford, CA: Stanford Univ. Press

Kocka J. 1980. The rise of the modern industrial enterprise in Germany. In *Managerial Hierarchies*, ed. A Chandler, H Daems. Cambridge, MA: Harvard Univ. Press

Kono T. 1984. *Strategy and Structure of Japanese Enterprises.* London: MacMillan

Kotz D. 1978. *Bank Control of Large Corporations in the United States.* Berkeley, CA: Univ. Calif. Press

Lane C. 1989. *Management and Labour in Europe.* Aldershoot, Engl.: Edward Elgar

Larner R. 1971. *Management Control and the Large Corporation.* New York: Dunellen

Lawrence P, J Lorsch. 1967. *Organization and Environment.* Boston: Harvard Bus. School

Leff N. 1978. Industrial organization and entrepreneurship in developing countries: the economic groups. *Econ. Dev. Cult. Change.* 26:661–75

Lincoln JR, Gerlach M, Takahashi P. 1992. Keiretsu networks in Japan. *Am. Sociol. Rev.* 57:561–85

March J, Simon H. 1958. *Organizations.* New York: Wiley

Marris R. 1964. *The Economic Theory of Managerial Capitalism.* Glencoe, IL: Free

Meyer J, Rowan B. 1977. Institutionalized organizations: formal structure as myth and ceremony. *Am. J. Sociol.* 83:340–63

Mintz B, Schwartz M. 1985. *Power Structure of American Business.* Chicago: Univ. Chicago Press

Mizruchi M. 1982. *The American Corporate Network, 1904–74.* Beverly Hills, CA: Sage

Mizruchi M, Schwartz M. 1988. *Intercorporate Relations: The Structural Analysis of Business.* Cambridge, Engl.: Cambridge Univ. Press

Mizruchi M, Stearns L. 1988. A longitudinal study of the formation of interlocking directorates. *Admin. Sci. Q.* 33:194–210

Myers S. 1984. The capital structure puzzle. *J. Finance* 39:575–92

Nelson R, Winter S. 1982. *An Evolutionary Theory of Economic Change.* Cambridge, MA: Harvard Univ. Press

Orru M, Biggart N, Hamilton G. 1991. Organizational isomorphism in East Asia. In *The New Institutionalism in Organizational Analysis*, ed. Walter Powell, Paul DiMaggio, pp. 361–89. Chicago: Univ. Chicago Press

Palmer D. 1983. Broken ties: interlocking directorates and intercorporate coordination. *Admin. Sci. Q.* 28:40–55

Palmer D, Barber B, Zhou X, Soysal Y. 1995. The other contested terrain: the friendly and predatory acquisition of large American corporations in the 1960s. *Am. Sociol. Rev.* In press

Penrose E. 1959. *The Theory of the Growth of the Firm.* New York: Wiley

Pfeffer J. 1981. *Power in Organizations.* Marshfield, MA: Pittman

Pfeffer J, Salancik G. 1978. *The External Control of Organizations.* New York: Harper & Row

Piore M, Sabel C. 1984. *The Second Industrial Divide.* New York: Basic

Powell W. 1990. Neither market nor hierarchy: network forms of organizations. In *Research in Organizational Behavior*, ed. LL Cummings, B Staw, 12:295–336. Greenwich, CT: JAI

Powell W, Brantley P. 1992. Competitive cooperation in biotechnology. In *Networks and Organizations: Structure, Form, and Action*, ed. N Nohria, R Eccles, pp. 366–94. Boston: Harvard Univ. Press

Powell W, Smith-Doerr L. 1994. Networks and economic life. In *The Handbook of Economic Sociology*, ed. Neil Smelser, Richard Swedberg, pp. 368–402. New York: Russell Sage

Ross S. 1977. The determination of financial structures: the incentive signalling approach. *Bell J. Econ.* 8:23–40

Saxenian A. 1994. *Regional Networks: Industrial Adaptation in Silicon Valley and Route 128.* Cambridge, MA: Harvard Univ. Press

Scott W R, Meyer J. 1994. *Institutional Environments and Organizations.* Thousand Oaks, CA: Sage

Simon H. 1957. *Administrative Behavior.* New York: Macmillan

Simon H. 1960. On the concept of organizational goals. *Admin. Sci. Q.* 1:20–35

Stigler G. 1968. *The Organization of Industry.* Homewood, IL: Dorsey

Stokman F, Zeigler R, Scott J. 1985. *Networks of Corporate Power.* Cambridge, Engl.: Polity

Thompson JD. 1967. *Organizations in Action.* New York: McGraw-Hill

Useem M. 1993. *Executive Defense.* Cambridge, MA: Harvard Univ. Press

Westney E. 1987. *Innovation and Imitation: The Transfer of Western Organizational Patterns to Meiji Japan.* Cambridge, MA: Harvard Univ. Press

White H. 1981. Where do markets come from? *Am. J. Sociol.* 87:517–47

Whitley R. 1990. Eastern Asian enterprise structures and the comparative analysis of business organizations. *Organ. Stud.* 8:125–47

Whitley R. 1992. *European Business Systems.* London: Sage

Williamson O. 1975. *Markets and Hierarchies.* New York: Free

Williamson O. 1981. The modern corporation: origins, evolution, attributes. *J. Econ. Lit.* 19:1537–68

Williamson O. 1985. *The Economic Institutions of Capitalism.* New York: Free

Williamson O. 1988. Corporate finance and corporate governance. *J. Finance* 43:78–93

Williamson O. 1991. Comparative economic organization: the analysis of discrete structural alternatives. *Admin. Sci. Q.* 36:269–96

Williamson O, Ouchi W. 1981. The markets and hierarchies program of research: origins, implications, and prospects. In *Perspectives on Organization Design and Behavior*, ed. Andrew H Van de Ven, William F Joyce, pp. 347–70. New York: Wiley

Yoshino M. 1967. *Japan's Managerial System.* Cambridge, MA: MIT Press

Zucker L. 1977. The role of institutionalization in cultural persistence. *Am. Sociol. Rev.* 42: 726–43

Zucker L. 1987. Institutional theories of organizations. *Annu. Rev. Sociol.* 13:443–64

Zucker L. 1988. *Institutional Patterns and Organizations: Culture and Environment.* Cambridge, MA: Ballinger

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SCIENTIFIC CAREERS: Universalism and Particularism[1]

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ABSTRACT

Science is an institution with immense inequality in career attainments. Women and most minorities, as groups, have lower levels of participation, position, productivity, and recognition than do white men. Research in the sociology of science has focused on the degree to which different outcomes have resulted from universalistic and from particularistic processes. In this paper we 1) depict the career attainments of women and minorities in science, 2) consider the meaning and measurement of universalism compared to particularism, 3) analyze the causes of differential attainment with a view to assessing evidence for violations of universalism, 4) propose conditions under which particularism is likely to occur, and 5) consider methodological problems that affect this research.

INTRODUCTION

In a theory of the normative structure of science developed over 50 years ago, Robert Merton ([1942] 1973) argued that the institution of science has an ethos consisting of the norms of universalism, communism, disinterestedness, and organized skepticism. A substantial body of research in the sociology of science has involved an assessment of the operation of universalistic standards

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[1] The ordering of the authors has no particular meaning, except that the first author was initially invited to undertake this article.

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in processes of stratification in science (Zuckerman 1988:515–19). As a precept of science, universalism entails two related requirements. First, universalism requires that when a scientist offers a contribution to scientific knowledge, the community's assessment of the validity of that claim should not be influenced by personal or social attributes of the scientist and should be subject to "pre-established impersonal criteria" (Merton [1942] 1973:270). Second, universalism requires that a scientist be fairly rewarded for contributions to the body of scientific knowledge. This is summarized nicely in Merton's phrase that "careers should be open to talent" (Merton [1942] 1973:272). Particularism, in contrast, involves the use of functionally irrelevant characteristics, such as sex and race, as a basis for making claims and gaining rewards in science.[2]

Science has been both characterized as the most universalistic of institutions (Cole & Cole 1973:89, 122; Cole 1979:4; Gaston 1978) and debated as an institution in which universalistic standards falter and fall short (e.g. Mitroff 1974, Mulkay 1976; see Cole 1992:157–76 for a review of the debate). While debate persists about the scientific community's adherence to Merton's ethos of science, it is unquestionably true that science is an institution in which immense inequality exists in career attainments (Zuckerman 1988:526–27). The fundamental link between the ethos of science and inequality in science is seen in the distinction between inequality and inequity. To what extent is the inequality in science equitable or inequitable? To what extent can the inequality be explained by normatively justifiable, universalistic characteristics as opposed to unjustifiable particularistic characteristics.[2] In this way, stratification has been regarded as a "strategic starting point" (Cole & Cole 1973:15) for inquiry into the social system of science. Moreover, we suggest that understanding the differences in attainments across underrepresented groups in science such as women, blacks, and Hispanics is critical for understanding stratification in science. On another level, understanding stratification in science by sex and race/ethnicity is important for addressing the underutilization of these increasingly important groups.

In this paper, we: 1) depict the career attainments of women and minorities in science; 2) consider the meaning and measurement of universalism in comparison with particularism; 3) analyze the causes of differential attainment with a view toward assessing evidence for violations of universalism; 4) propose conditions under which particularism is likely to occur; and 5) consider methodological problems that affect this research area.

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[2] In Parsons & Shils's (1951) delineation of universalism versus particularism as modes characterizing social relations, they distinguish not only between universalism (relations governed by uniform terms) and particularism (relations governed by particular properties) but also between ascription (priority given to attributes of parties) and achievement (priority given to actual or expected performance of parties). However, in Merton's theory of the normative structure of science and in subsequent work that supports or criticizes his model of the ethos of science, 1) universalistic and achievement standards and 2) particularistic and ascriptive standards tend to be grouped into two categories, rather than the four of Parsons & Shils's paradigm. This occurs since many of the most important attributes leading to particularism, for example, race and sex, are also ascribed characteristics.

DIFFERENTIAL ATTAINMENT IN SCIENTIFIC CAREERS

Scientific occupations are among the most prestigious in American society. The Nakao-Treas prestige scale for the 1980 census classification of occupations assigns a score of 73 to physical and biological scientists, a score exceeded only by 74 for lawyers and 86 for physicians (Nakao & Treas forthcoming). Yet within science, as in certain other occupations such as law (Epstein 1986), a complex hierarchy exists allowing for great variation in career attainments. The focus of this section is on variation in attainments by sex and race, as a first step in assessing the processes by which attainments are allocated.

Four dimensions of career attainments are considered: participation, position, productivity, and recognition. Participation refers to employment in science and engineering (hereafter, S/E), with advanced degrees usually a prerequisite to employment. Position refers to organizational location and to rank within organizations. Productivity includes contributions to scientific knowledge, most commonly examined through publications. Recognition refers to acknowledgment by the scientific community for contributions and achievements, with examples ranging from citing a published paper to bestowing honorific awards as prestigious as the Nobel prize. Substantial inequality exists in the distribution of each of these dimensions of career attainment, with women and minorities as groups found at the lower end of each distribution.

Participation

In 1991, 18% of the employed doctoral level scientists and engineers in the United States were women (CPST 1994: Table 4-11), compared with 12% a decade earlier. Although data are not available on the scientific employment of women over the century, data on doctoral degrees obtained are. These data are not fully comparable to those of participation, since prior to World War II the employment prospects in science for doctoral women were limited; women with doctorates were often unemployed. However, data on degrees do indicate the proportion of women who could participate in science.[3]

The trend in women's attainment of doctoral degrees is not one of consistent improvement. In the 1920s, women made up 12% of the PhDs in S/E. From the 1920s to the 1950s there was a steady erosion, with the proportion of degrees awarded to women reaching a low of 6.7% in the 1950s and rebounding only slightly to 7.9% in the 1960s[4] (CPST 1989: Table 2-1). The climate of the 1950s is reflected in Keller's account of the "dark times" faced by women in science (1991:230). She notes that in 1956 MIT convened a committee to consider whether to continue admitting women students—the recommendation was that coeducation be terminated. It was not until the 1970s that the proportion of doctoral degrees earned by women reached 15%, finally exceeding the proportion in the 1920s. Continuing gains were made during the 1980s, so that from 1980 to 1988, women earned 26% of the PhDs in S/E (CPST 1989: Table 2-1).

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[3] Hereafter, the term "scientist" will refer solely to doctoral level scientists.

Despite increasing proportions of degrees awarded to women, the employment of women is highly uneven across fields. As of 1991, 84% of doctoral women in S/E were employed in the life sciences, psychology, and social sciences. In contrast, half of the men were employed in these three areas. Men are twice as likely as women to be in physical, mathematical, and environmental sciences and in computer information sciences,[5] and nearly seven times more likely to be in engineering (National Science Foundation, 1991 Survey of Doctoral Recipients, unpublished data).

With the exception of Asians, nonwhite racial and ethnic groups are also underrepresented among employed doctoral level scientists and engineers. In 1973, 0.9% of employed scientists and engineers were black, 4.3% were Asian, and 92% were white (National Science Foundation, 1991 Survey of Doctoral Recipients, unpublished data).

Minority participation has increased over the past two decades. In 1991, 2.2% of doctoral level scientists and engineers were black, 1.9% were Hispanic, 10.2% were Asian, and 0.2% were Native American, while the 86.9% majority were white (CPST 1994: Table 4-9). It is important to recognize that Asians and Hispanics are not a homogeneous category. The participation of some groups (e.g. Japanese) may be relatively high, while that of other groups (e.g. Vietnamese) is not. Further, participation in science and engineering of native-born Asian Americans as opposed to immigrants is an issue that has just begun to be addressed (Tang 1993).

Beyond their limited participation, little is known about racial and ethnic minorities in science.[6] Researchers have regarded minorities in science as a

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[4] While as noted by Cole (1979:205), the *number* of doctorates awarded to women at mid-century increased over the number awarded in the 1920s and 1930s, the critical point is that the *proportion* of female doctorates in S/E *decreased*.

[5] In 1989, 19,797 employed scientists were classified in computer science. As a result of a change in definition of computer science in the 1991 Survey of Doctoral Recipients, the number was reduced to 5376.

[6] Hereafter, the term "minorities" will be used to refer to racial and ethnic minorities.

"statistical rarity" (Bechtel 1989). As such, minorities are groups for whom detailed, reliable data have been difficult to locate and for whom inferences have been difficult to make (Cole & Cole 1973:152–53). Studies of minority scientists require oversampling to ensure sufficient numbers for analyses. Drawing samples of minorities is difficult, however, because often their minority status cannot be determined by name alone. Consequently, rosters of scientists from professional societies or dissertation abstracting services cannot be used. Drawing samples of minorities often requires data from the National Research Council's Survey of Doctoral Recipients or data from minority caucuses within disciplines (Rosenfeld 1991:41). Not surprisingly, few studies of scientists include racially comparative samples. As Pearson put it: "Despite more than a century of participation by Blacks in the professional scientific community, sociologists of science have neglected the study of Black American scientists. As a result, our knowledge of Black American scientists remains very sketchy" (1988:205). Information on women (which may of course include minority women) is far more common than for racial minorities, a point reflected in the content of this paper.

Particularly for certain minorities but also for women, levels of participation are the result of "successive filtering" (Zuckerman & Cole 1975:83). At each stage of education, the percentage of most minority students steadily erodes, so that their participation in science is substantially below parity. The underrepresentation of blacks has been attributed in part to educational attrition, which is in turn related to a lack of financial aid and perceptions of poor job prospects (Fechter 1989). Switching out of science fields into nonscientific fields for the doctorate is another form of attrition. Among a 1973-1974 cohort of doctoral recipients who had undergraduate majors in the life sciences, 50% of the blacks compared with 80% of the whites earned their doctorate in the life sciences (National Board on Graduate Education 1976, cited in Pearson 1988).

Further, receipt of a doctorate in S/E does not imply *full participation* in these fields. Historically, blacks with doctorates in science were forced to teach in high schools or in black colleges, where libraries, laboratories, and opportunities for training students were limited (Bechtel 1989). Prior to World War II, women with science doctorates faced restricted employment either as faculty in women's colleges or as research associates in university laboratories (Rossiter 1982), where they represented a "good investment" as skilled, low-cost laborers who were grateful for the work (Fox 1991). Disproportionately often, women and blacks with doctoral degrees in science found no scientific employment (Bechtel 1989, Rossiter 1982).

Unemployment is no longer a frequent condition for underrepresented groups in science. Vetter (1981) recorded that nearly 90% of women with doctoral degrees in S/E were in the labor force at any given time. Still, unemployment is more common for women. In 1991, unemployment of scientists was twice as likely for women (2.2%) as for men (1.3%). The disparity is largest for physical scientists among whom 4.2% of the women compared with 1.7% of the men are unemployed, and for environmental scientists among whom 3.2% of the women compared with .8% of the men are unemployed. The disparity is smallest for computer scientists, among whom 1.6% of the women and 1.4% of the men are unemployed (National Science Foundation, 1991 Survey of Doctoral Recipients, unpublished data). While it is presumed that career interruptions such as unemployment affect the research productivity of scientists (Rosenfeld 1991:21), little is known about the causes of interruptions and the way in which interruptions affect women and minorities.

Position

Organizational location and rank are two aspects of position that reveal differential attainment. First, men and women work in different sectors. As of 1991, women were less likely than men to be employed in industry (29% vs 38%), more likely to be in hospitals and nonprofit organizations (11% vs 6%), slightly less likely to be in government or the military (5% vs 7%), and somewhat more likely to be in educational institutions (51% vs 46%) (National Science Foundation, 1991 Survey of Doctoral Recipients, unpublished data). The higher proportion of women in educational institutions and the lower proportion of women in industry partly reflect the larger proportions of men in engineering, where employment is more likely to be in the industrial sector. If we exclude engineers, 29% of the women and 33% of the men are in industry, while 52% of the women and 49% of the men are in educational institutions.

Education remains the predominate sector of employment for scientists and engineers, and 95% of those in education are in higher education. Academia is central to science and has even been characterized as the "home of science" (Wolfle 1972). This is not just because of the large proportion of scientists employed in academia, but also because of the research and training functions concentrated there. The evolution of science and the evolution of higher education have been reciprocal developments in the United States (MF Fox, forthcoming). Consequently, much of the research and focus of this paper is on academic scientists.

Stratification in science reflects and connects with stratification in academia, particularly in the ranking of institutions. American higher education is not just diverse in its missions and clienteles (Bowen & Schuster 1986); it is also ranked according to its tasks and jurisdictions (Clark 1987). This is reflected in broad classifications of institutions. Research universities that have active research programs, federally funded research projects, and graduate training programs have the highest rankings. Institutions with largely undergraduate enrollments have lower rankings, although this varies with the selectivity of admissions and the quality of the faculty. Comprehensive colleges evolved from teachers colleges into a mixed state in which they are no longer an education school and not really a university. They often suffer from vague identity and low distinction (Clark 1987:115).

In general, the less prestigious the type of institution, the more likely it is to employ women and minorities. The proportions of women and blacks are lower in research universities, and higher in comprehensive and in liberal arts colleges (CPST 1994: Table 5-15). The pattern of lower proportions of women and blacks in universities merits attention because it is in these institutions that human and material resources are available to support research with equipment, libraries, graduate student assistantships, and collaborators. These resources in turn affect research productivity and ultimately scientific stature. For Hispanics, the configuration is not as clear, because virtually no Hispanics in these S/E fields teach in liberal arts colleges (CPST 1994: Table 5-15).

Within institutions of the same type, women and minorities have different types of academic appointments. Academic rank is a telling indicator of position in academia.

Minorities and particularly women in S/E are underrepresented among tenured faculty and overrepresented among non–tenure track faculty. Moreover, the higher the rank, the lower the proportion of women: as of 1991, women were 8.7% of the full professors, 20.9% of the associate professors, and 29.1% of the assistant professors. In the subprofessorial positions of instructor and lecturer, which usually do not have the possibility of tenure, women were almost half (43%) of the faculty (CPST 1994:Table 5-1). As we shall see, the higher proportions of women at lower ranks are not a simple function of low seniority or research productivity.

Productivity

While research productivity is not strictly equivalent to publication productivity, publication is generally taken as an indication of research (Fox 1983, 1992). In the analysis of scientific careers, publication productivity is important for two reasons. First, publication is the central social process of science. It is the way in which research is communicated, exchanged, and verified (Hagstrom 1965, Merton [1968] 1973). Second, until we understand the differences in productivity between groups by race or sex, we cannot adequately assess other differences between groups in attainments such as position and recognition (Fox 1991). To the extent that science is universalistic, attainments should be allocated on the basis of contributions to scientific knowledge, which are reflected in publication productivity.

Productivity in science is highly skewed. Most work is published by a few, while the majority publish little or nothing (Price 1963:42–44). The distribution of publication productivity is such that about 15% of the scientists account for

50% of the publications. This persistent pattern repeats across fields and applies to both women and men. It is found in chemistry (Reskin 1977), biochemistry (Long 1992), various natural and social sciences (Cole 1979), social scientists in four fields (Fox 1994), and scientists in six fields (Cole & Zuckerman 1984).

While a small prolific group of scientists accounts for a large proportion of published work, as a group women publish fewer papers than men, for reasons that are discussed below in the section on causes. Over a 12-year period, the median number of papers published by male scientists in chemistry, biology, psychology, and sociology was 8, compared with 3 for women (Cole 1979). Among scientists in six fields who were matched for year of PhD and doctoral department, women published half as many papers as men did (Cole & Zuckerman 1984). Among psychologists, men are significantly more productive than women, publishing 1.7 compared with 0.7 papers in a three-year period (Helmreich et al 1980). Women ecologists published 47% as many papers as men in their field (Primack & O'Leary 1989). In biochemistry, slight sex differences in productivity at receipt of the doctorate increased over the first decade and gradually lessened in later years (Long 1992). For chemists, however, Reskin (1978a) reports small differences. Likewise, among social scientists in four fields, Fox (1994) found small but significant differences in a three-year article count, with 2.25 articles for women and 2.5 for men. Recent data on social scientists and biologists point to convergence in publication levels for men and women (Ward & Grant 1995).

The only study of differences in productivity levels among racial groups is Pearson (1985). He reports that in the physical, biological, and social sciences blacks publish less than whites across their career and in the five years prior to the study, with racial differences being small in the period prior to receipt of the degree.

Recognition

Recognition by peers is an important indication of a scientist's contributions to the advancement of science. Recognition serves as a reward for past performance and an inducement for future performance, and in this sense it is important as a reinforcement for valued activity (Merton [1968] 1973, Hagstrom 1965:12, 21). Citations to a scientist's research are an important, albeit imperfect, measure of recognition (Zuckerman 1988:526–27). The distribution of citations is even more skewed than for publications. Of the authors in *Science Citation Index* (*SCI*) who were cited at all between 1961 and 1980, over two decades 62% were cited no more than five times, only 6% were cited as many as 100 times, and a mere 1% were cited 500 times or more (ISI 1981, cited in Zuckerman 1988:527). Out of 3.9 million articles cited in SCI in 1979, 70% were cited only once, while a mere 0.009% were cited more than 100 times (Garfield 1981)

Citations are highly correlated with publications, with reported correlations ranging from 0.63 to 0.93 (Reskin 1979, Cole & Cole 1973:121, Long 1992). While much less information exists on sex differences in citations than in publications, the evidence suggests that men and women are more similar in citations than publications (Cole & Zuckerman 1984, Long 1992). The explanation appears to be that while woman publish less, they receive more citations to each individual paper.

We know of only one study that includes citation levels by race. In this study, Pearson (1985) reports that whites have higher citation levels than blacks among physical, biological, and social scientists.

Awards in science also go to few, while the majority remain unrecognized. Among physicists, only 15% have received an award other than a postdoctoral fellowship, and 11% of the physicists received 70% of all awards (Cole & Cole 1973). At the top of the pyramid of awards, recognition is a rare event. In 1994, out of 367,440 employed scientists (excluding engineers), 0.6% have been elected to the National Academy of Science, and 95% of the members are men (National Research Council, unpublished data).

While there are female and minority scientists who have been extraordinarily successful, women and minorities as groups are less successful than white men on all dimensions that characterize participation and achievement in science. The fact of inequality demands explanations of the processes generating the inequality. In assessing these processes, the meaning and measurement of universalism, particularism, and discrimination are essential.

UNIVERSALISM, PARTICULARISM, AND ASSESSING DISCRIMINATION

Universalism dictates that the allocation of rewards and resources should be based solely on the merits of a scientist's contribution to the advancement of scientific knowledge. These contributions can occur directly through the publication of new research or indirectly through performance as a teacher or administrator (Zuckerman & Merton 1973 [1972]). In contrast, particularism involves the consideration of functionally irrelevant characteristics such as race or sex in the allocation of resources and rewards. To the degree that race and sex affect the allocation independently of scientific contributions, discrimination occurs.

In the late 1960s and 1970s, a substantial body of research developed to examine how universalism and particularism operate in the scientific career (Allison & Stewart 1974, Crane 1965, Gaston 1978, Hagstrom 1971, Hargens 1969, Hargens & Hagstrom 1967, Long 1978, Zuckerman 1977). The most ambitious example of this research is found in Cole & Cole's (1973) *Social Stratification in Science.* This research assessing universalism combined Merton's functionalism with Price's (1963) work on the distribution of productivity, as well as the emerging field of bibliometrics that benefited from Garfield's development of SCI. The assessment of universalism was heavily influenced by the status attainment approach found in Blau & Duncan's landmark study *The American Occupational Structure* (1967) and Duncan's article "Inheritance of Poverty or Inheritance of Race?" (1968). This approach assessed the influence of ascribed characteristics, such as race, and achieved characteristics, such as education, on occupational attainment.

When applied to science, the general strategy is to examine the relationship between achieved and ascribed statuses and outcomes such as prestige of employment, productivity, and academic rank. To the extent that ascribed statuses such as race and sex explain outcomes *after controlling* for performance, particularism is said to operate and discrimination occurs. In evaluating this research, four issues of meaning and measurement are critical.

Outcomes versus Processes

Sex or race differences in outcomes are not necessarily evidence of discrimination (Zuckerman 1970:241), nor are similarities of outcomes necessarily evidence of a lack of discrimination. Differential outcomes can be generated by both universalistic and particularistic processes, a point discussed by Cole & Fiorentine (1991). For example, women or minorities may on average receive less prestigious jobs because they are less productive. This would be a universalistic process. Or, women or minorities may receive less prestigious jobs than white men with equal productivity as a result of discrimination, which would be a particularistic process. Of course, both universalistic and particularistic process may be operating simultaneously. Alternatively, if there were no sex or race differences in the average prestige of first jobs, it would be premature to conclude that there was no discrimination since woman and minorities could be more productive than white men.

Appropriate Controls

The primary means for quantitatively assessing discrimination is referred to as "sophisticated residualism" (Cole 1979:29), an approach detailed by Duncan (1968). Discrimination is indicated by sex and race differences in recognition, for example, after controlling for the levels of *relevant* independent variables. Residualism depends critically on the variables that are being controlled. Different specifications of controls can result in different conclusions. Failure to control for the appropriate variables can lead to false positives and false negatives. For example, models for the prestige of the first job that exclude productivity may overestimate the negative effect of being a woman since women on average have lower productivity.

The Career as a Life Course

The career should be viewed as a series of processes with assessments of discrimination applied to each process. Life course analysis argues that the career should be studied as a series of linked events occurring over time within specific contexts. This rich and emerging approach, which has been championed by Elder (1978, 1992), offers critical insights into how the career should be studied and hence on how discrimination can be assessed. To focus on any specific outcome in the career without consideration of the prior processes leading to it can be misleading. For example, if no sex or race differences are found in election to the National Academy of Sciences after controlling for scientific productivity, we might conclude that no discrimination exists in the allocation of this award. However, this conclusion could be misleading. It is possible that the process by which resources are allocated to support productivity favor white men and disadvantage women and minorities. These processes of relative advantage may be responsible for the overrepresentation of white men in the Academy.

Uniform Costs and Differential Returns

Discrimination can most simply be indicated statistically as the effects of sex or race after controlling for relevant variables. In most types of analysis the effects of sex or race are introduced by dummy variables indicating group membership. The coefficients for these variables indicate uniform costs to all members of a group. For example, consider a model explaining the prestige of the first job. A negative coefficient for a dummy variable indicating that the scientist is a women would indicate the cost of being a woman after controlling for other variables. This cost is uniform in the sense that it is the same regardless of the levels of any other variables in the model. Discrimination can also be indicated by sex or race differences in the way in which contributions to science are translated into rewards or resources. To continue our example, discrimination can also be indicated by sex or race differences in the coefficients for productivity. If the slope coefficient for productivity is smaller for women or minorities than white men, women or minorities would be penalized by receiving a smaller return for their contributions. We return to this point in our discussion of methodological problems below.

In the following section we analyze causes of differential attainment by race and sex, with a view toward assessing the extent to which particularistic processes govern participation, position, performance, and recognition.

CAUSES OF DIFFERENTIAL ATTAINMENT[7]

We have suggested two ways in which particularistic effects of race and sex can operate. First, if variables indicating the race or sex of a scientist significantly affect an outcome of the scientific career after controlling for relevant variables, the method of residualism points to discrimination. Second, if the way in which achievements translate into resources or rewards differs by sex or race, discrimination may also be indicated.

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[7] This section has benefited from Fox 1995 and Rosenfeld 1991.

In order to apply these criteria to the scientific career, the career should be viewed as a series of linked processes developing over time, and care should be taken to assess the operation of particularism within the context of a specific career process. We consider the following explanations of differential outcomes: 1) individual level factors such as intelligence; 2) marriage and family; 3) graduate education and training; 4) organizational and disciplinary context; 5) role performance and particularly research productivity; and 6) processes of cumulative advantage that serve to reinforce other effects. Finally, we provide a general assessment of the operation of universalistic and particularistic factors related to race and sex.

Personal Characteristics

Because ability is a requisite for training and performance in science, it might be considered as an important factor in explaining success. Ability, as indicated by intelligence tests, however, does not account for attainments in science. First, while intelligence is a prerequisite for becoming a scientist, among those who have obtained the doctorate, differences in measured ability do not predict subsequent levels of performance (Bayer & Folger 1966, Cole & Cole 1973:69). Second, while we know of no studies of the relationship between intelligence and career attainments by sex, female scientists generally score higher on standardized tests (Cole 1979:62, CEEWISE 1979:23–25). Indeed, it is likely that women who succeed in obtaining a doctorate in science are a more highly select group than men in terms of motivation and abilities that lead to performance (Hornig 1987).

Marriage and Family

The loss of time available for scientific work as a result of family obligations is likely to be greater for women, since women are more likely to be the primary caretakers in families (Moen 1985). Further, it is possible that the negative stereotyping of women with children adversely affects their career chances. For example, faculty may label a female student as being less committed to her career if she tries to raise a family while in school, or faculty may negatively evaluate a woman simply because she might have children (Rosenfeld & Jones 1986, Zuckerman & Cole 1975). In assessing the evidence for the effects of marriage and family, it is important to keep in mind that female scientists are and have been much less likely to be married or to have children than are either male scientists or women in the general population (Astin 1969:26–31, Centra 1974, Fox 1994, Grant et al 1993, Long 1990). Thus, the demands of marriage and motherhood do not affect a substantial proportion of female scientists.

Marriage may constrain geographic mobility of female scientists, but geographic location does not have consequences for academic rank (Coggeshall 1981, Marwell et al 1979, Rosenfeld 1981; see also Hurlburt and Rosenfeld 1992). The research of Long and his colleagues (1993) on biochemists shows a positive effect of marriage upon women's odds of being promoted from assistant to associate professor; for promotion to full professor, marriage had no effect. Other data (Ahern & Scott 1981) indicate that while marriage negatively affects the rank of academic women, the effects are not significant (but note that they did not have any measures of research productivity).

The preponderance of data indicate that being married has a small positive effect while the effects of having children are weak or non-existent. Several studies have found a positive effect of marriage on productivity (Cole 1979, Long 1990, Fox 1994, Reskin 1978a), while Helmreich et al (1980) found no effect. The presence of children has been found to have no effect on women's publication productivity (Cole & Zuckerman 1987, Hamovitch & Morganstern 1977, Fox 1994), a nonsignificant negative effect (Long 1990, Reskin 1978a), a significant negative effect (Hargens et al 1978), or a positive effect (Astin & Davis 1985, Fox & Faver 1985, Fox 1994).

Education and Training

Conceptions of the scientific role, styles of work, and standards of performance are developed during graduate school (Zuckerman 1977), and thus it is reasonable to look to graduate school background as an explanation of differential attainments by sex and race. According to key indicators of graduate background, however, male and female scientists are remarkably similar. They are equally likely to receive their doctorate from top ranking universities (National Research Council 1983) and are similar in indicators of financial support for graduate training (National Research Council 1979, 1983). However, these data do not specify the quality or character of assistantships (Hornig 1987), which may indicate different opportunities to join research groups, collaborate, and gain access to the culture of science (Fox 1995).

Minorities do differ from whites in their doctoral origins. Blacks are more likely to receive their doctorate from lower ranking departments, are more likely to interrupt graduate studies and to study part-time, and take longer to complete their degrees (Pearson 1985). Native Americans, blacks, and Hispanics are less likely than whites and Asians to report that the university is their main source of financial support (Pearson 1987:137). However, funding disadvantages of earlier cohorts of blacks have diminished in later cohorts (Pearson 1985:167).

These aggregate data do not address the dynamics of graduate education such as student-faculty interactions, advising, and mentoring that may affect the career attainments of women and minorities (Fox 1995, Reskin 1978b).

Collaboration with a mentor is a particularly important factor since it affects predoctoral productivity, job placement, and later productivity (Long & McGinnis 1985). In his study of biochemists, Long (1990) finds that having young children decreases a woman's odds of collaborating with the mentor, while this effect does not exist for men. Having a female mentor increases the odds of women collaborating, but in biochemistry as in most other scientific fields, the number of female mentors is limited. Grant and her colleagues (1993) report that women and minorities in chemistry experience problems with mentors, including difficulty gaining access to eminent mentors. In one of the few studies of minority experiences in graduate education (Duncan 1976 cited in Pearson 1987:144–145), three quarters of the minority students reported that they were "on the fringes" of their departments and that they were less likely to report that a professor had helped them to "become a professional." Minority group experiences may be changing, and experiences may differ among groups. Much needs to be determined in these areas.

Researchers have examined the effect of doctoral origins upon 1) the initial job obtained, 2) academic rank, and 3) research productivity. Doctoral origins have strong effects on the initial job obtained, but it is less clear how the effect varies by sex. Hurlbert & Rosenfeld (1992) reported that the effect of the prestige of the doctoral department was the most important variable affecting the prestige of the first job, and that its effect did not differ significantly by sex. The effect of productivity was statistically insignificant. Cole (1979:141), on the other hand, found a slightly stronger effect for men of doctoral origins on the prestige of employing departments. Looking at type of academic appointment, Reskin & Hargens (1979) found an insignificant effect of doctoral origins on whether the first job was tenure track, and this effect did not differ by sex. Little is known about sex differences in the effect of doctoral origins on the organizational context of employment (e.g. academic, government, industry).

Studies of academic rank have generally shown that the effects of doctoral origins are insignificant and do not differ by sex (Cole 1979:1411, Hurlbert & Rosenfeld 1992, Long et al 1993), although Long and his colleagues found that the effect of doctoral origins on promotion to full professor was significant but similar for male and female biochemists. The effect of doctoral origins on research productivity appears to be greater for men than for women among chemists (Reskin 1978a), biochemists (Long 1990), and scientists in six fields (Cole 1979:141).

Overall, minorities appear to be disadvantaged in the prestige of their doctoral origins, but little is known about the process by which they are admitted to graduate departments and their experiences once admitted. Men and women have similar doctoral origins. The biggest differences in the effects of origins may be in relationships with the mentor. In considering the effects of origins on later outcomes, the effects appear to be slightly stronger for men, perhaps indicating that they are given a greater return than women for their doctoral training.

Location and Context

Organizational context is especially important in science because scientific work relies upon facilities, funds, apparatus, and teamwork. Through largely informal interactions within the workplace, scientists continually shape, test, and update their research. In this way, performance is tied to the environment of work (Fox 1991, Crane 1965, Hagstrom 1967). A series of studies have established that organizational context affects research productivity. Across broad types of employers (e.g. academia, industry), a scientist's level of productivity changes to conform to the organizational context of employment (Long & McGinnis 1981, Reskin 1977). Within academia, longitudinal data from five fields show that departmental prestige affects productivity, and that changes in departmental location result in changes in productivity (Allison & Long 1990, Long 1978).

Unfortunately, no studies are available that trace the effects of organizational context on productivity for comparable samples of men, women, and minorities. Future research needs to assess whether the effects of context differ for women and minorities. Research on specific organizational processes suggests that resources and opportunities may operate differently for different groups. In a national sample of social scientists in four fields, Fox (1995) finds that in both baccalaureate and doctoral granting departments, women report significantly less interaction with and recognition from faculty in their departments. In masters and doctoral granting departments, women gave significantly lower rankings to the resources available to them, and in PhD departments they report significantly higher undergraduate teaching loads. The factors of interaction, reported resources, and teaching loads correlate with productivity levels (Fox 1995). Pearson (1985:168) reports race differences in perceptions of communication and exchange. Black scientists feel that whites do not regard them as intellectual peers and are reluctant to confer with them. Blacks feel excluded from communication about and access to important scientific knowledge, especially to information about pathbreaking research and funding opportunities.

Because science involves teamwork and shared resources, collaboration has been sought as an explanation of women's lower attainments in science. However, the data on collaboration are mixed. Studies of sociologists report that women are both less likely (Chubin 1974) and more likely (Mackie 1977) to collaborate. Other studies involving seven fields report that women were as likely as men to coauthor papers (Cole & Zuckerman 1984, Long 1992). The issue may be more subtle than simply rates of coauthorship. Women may have more difficulty establishing collaboration and may have fewer coauthors available to them (Fox 1991). The perceived significance of a coauthor's individual contribution to the work may also be less for women coauthors. These issues remain to be determined.

Role Performance

Under the norm of universalism, the allocation of resources and rewards should be most closely associated with contributions to science, which are most clearly indicated by measures of research productivity. The evidence suggests that this is not always the case. In the allocation of the first job after the PhD, research productivity is not an important factor (Hurlbert & Rosenfeld 1992, Long et al 1979), and there are no indications of sex differences. Evidence on rank advancement is mixed (Long et al 1993, Cole 1979:246); details are discussed below. Reskin & Hargens (Reskin 1978a, Reskin & Hargens 1979) found that early productivity has less effect on later productivity for women than for men, and they suggested that women may be more dependent on context, resources, and recognition.

Cumulative Advantage

Research initiated by Merton's ([1968] 1973) essay on the Matthew effect has established the importance of cumulative advantage in science. Cumulative advantage involves processes by which initial advantages, however obtained, are used to gain further advantage. Conversely, cumulative disadvantage reinforces and magnifies initial disadvantages. These processes may be especially important for understanding sex and race differences. First, women and minorities are less likely to be in jobs that support research and are more likely to be in less prestigious jobs. Such jobs restrict resources, making future productivity less likely. Second, the lower productivity of women and minorities may make it more difficult for these groups to obtain the resources to facilitate further productivity. As a consequence, sex and race differences in productivity may increase over time. This is consistent with sex differences in productivity over the first decade of the career (Cole & Zuckerman 1984, Long 1992). Long, however, reports decreasing differences after the first ten years which suggests that processes other than cumulative advantage may become important later in the career. Third, more subtle forms of discrimination such as exclusion from informal collegial networks may erode motivation and inhibit an individual's investments in research.

While these processes are plausible, there is little empirical research that addresses whether processes of reinforcement operate differently for women, minorities, and white men. The most detailed analysis is that of Reskin & Hargens (1979), who found that processes of cumulative advantage are weaker for women and concluded that there was evidence of discrimination.

The Case of Rank Advancement

Since it is in processes of rank advancement that the evidence for particularism is strongest, we discuss this topic separately. Not only are there large differences in the proportions of men compared with women at higher ranks, but those differences persist with controls for time since degree, fields, and publication productivity. For scientists at each level of productivity, Cole (1979) found that women were less likely than men to receive promotions, and this held with controls for departmental prestige. Among women and men matched on year and institution of PhD, field, and race, Ahern & Scott (1981) found large and pervasive sex differences in academic rank among natural, physical, and biological scientists. Unfortunately, they did not have controls for research productivity. In a sample of biochemists, Long and his colleagues (1993) report sex differences in advancement in rank after controlling for articles, citations, doctoral origins, and variables related to marriage and family. Sonnert's (1990) study of recipients of prestigious postdoctoral fellowships reports that the predicted rank of women is one third lower than that of men within the physical sciences, mathematics, and engineering (but not in biology) after controlling for years since the doctorate, fields, and fellowship. Outside of academia, in industrial science, some, but more limited, evidence exists of discrimination by sex in rank. In a study of scientists in a nonacademic firm, which included controls for human capital and demographic variables, women had fewer opportunities for promotion to management (Shenhav & Haberfeld 1988).

Summary

The operation of particularism has been evident, especially with respect to rank advancement and the granting of tenure. Because of the centrality of rank and institutional location to stratification in science, these findings are important. Resources, rewards, and productivity are connected, making the assessment of particularism complex. Although a universalistic norm may help to create pressure for resources and rewards to be allocated on the basis of performance, it does not guarantee equal opportunity for women and minorities to acquire the resources that enable performance in science. As we have seen, performance is not a simple function of motivation or ability. It is the result also of background and environmental context over the career—mentorship, advising, collaboration, teamwork, institutional facilities and apparatus. Although not the focus of our paper, qualitative studies, narratives, and widely publicized discrimination cases also point to the operation and complexity of particularism. Discrimination in science is a reality experienced by women and minorities, recorded in numbers of accounts across fields (Ainley 1990, Gornick 1990, Kass-Simon & Farnes 1990, Pearson & Bechtel 1989, Zuckerman et al 1991). Clearly much remains to be done to expand our understanding of stratification by sex and race in science. To this end, we conclude with two sections that offer suggestions on how research in this area might proceed. In the first section, we consider conditions for particularism (see also Cole 1992: 184). By considering conditions under which particularistic factors are most likely to operate, we point to areas where research might most effectively be conducted. In the final section, we consider methodological problems that restrict our ability to assess universalism and particularism. Attention to these problems, and solutions to them, may help to refine future research.

CONDITIONS FOR PARTICULARISM

On the basis of previous research and our inferences from it, we consider four conditions that support particularistic allocations on the basis of sex and race, particularly in academic science.

The Absence of Information

When little information on the qualifications of a scientist exists, particularistic factors are more likely to be brought to bear. This is consistent with Festinger's (1954) theory of social comparison, maintaining that in the absence of objective bases for judgment, people use social bases of comparison.

For example, Cole (1979:75–76) tested the relationship between the absence of information, the sex of a scientist, and the allocation of prestigious jobs and academic rank. Since the scientists in this sample had no publications, those making decisions on the allocation of position had no means of assessing research quality. Nonproductive men were more likely than nonproductive women to be located in prestigious departments and to obtain high academic ranks. In a sample of prolific scientists, women were not pushed out of prestigious departments, but they were deprived of high rank. Although the results are based upon small samples, they support the proposition that "functionally irrelevant characteristics, such as sex, will be more quickly activated when there are few functionally relevant criteria on which to judge individual performance" (Cole 1979:75).

The operation of particularism in the absence of information suggests that the initial allocation of positions may be extremely important for understanding sex and race stratification in science. Upon the completion of the doctorate or a postdoctoral fellowship, productivity is limited, and for those publications that are available it may be difficult to disentangle the work of the student and the mentor. If particularistic factors operate in the allocation of the initial job, processes of cumulative advantage may increase sex and race differences later in the career.

Ambiguity of Standards

When criteria for evaluation are ambiguous, particularistic outcomes are more likely to occur (Blalock 1967:99). Studies indicate that the more loosely defined and subjective the criteria, the more likely that white men will be perceived as the superior candidates and that bias will operate (Deaux & Emsmiller 1974, Nieva & Gutek 1980, Pheterson et al 1971, Rosen & Jerdee 1974). When the criteria for evaluation are standardized, particularistic considerations are reduced. Without such standards, functionally irrelevant attributes can govern in strong degree. As one example, in a survey of deans of liberal arts colleges, Seldin (1984) found that "personal attributes" such as dress, politics, and friends were a major factor in overall evaluation of faculty among 38% of the deans in 1978 and 28% in 1983. The relationship between organizational practices, criteria for evaluation, and particularistic outcomes is an important area for continuing research.

Some argue that ambiguity is inherent in science, that no pre-established impersonal criteria exist for matching research to nature, and that all evaluation is therefore subjective, based upon particular perspectives and interests (Mulkay 1979). In this case, according to Mulkay, it becomes "possible to conceive that women and the members of other social categories in science are systematically prevented from (or favored in) establishing that their work is of high quality" (Mulkay 1979:26). More specifically, the feminist critique of science has maintained that science is imbued with male cognitive authority, such that men's understandings and interpretations are more often taken as scientific truth, while women's may be taken as peculiar or false (Keller 1985, Harding 1986). Under conditions of cognitive authority, criteria for evaluation can be used flexibly depending upon the interests of the powerful parties involved (Mulkay 1976:245). In this way, cognitive authority may interact with and even permeate the organizational causes of attainments discussed earlier. These issues have been the subject of considerable interest, but little systematic empirical inquiry.

Less Developed Scientific Paradigms

Fields with less developed scientific paradigms have less consensus about research issues, methods, and course curricula. In fields with low consensus on criteria for decision-making, particularistic variables may account for more of the variance in outcomes. Hargens & Hagstrom (1982) found a positive association between consensus levels of fields and career outcomes based upon performance. Studies of editorial processes show that particularistic factors play a greater role in editorial policies and practices within social compared with physical and natural sciences (Beyer 1978, Yoels 1974). Further, in a study of outcomes of grant applications in the National Science Foundation, a stronger relationship between institutional membership on NSF advisory panels and institutional receipt of grants was found in sciences with less developed scientific paradigms (Pfeffer et al 1976).

These studies have not investigated the relationship between paradigm development and outcomes based upon sex and race. Future research should consider the degree to which levels of consensus may be related to particularistic effects of race and sex.

Secrecy

Open processes in hiring, promotion, and allocation of rewards increase universalistic decision-making, as does the exercise of due-process procedures. Secret and nonsystematic processes tend to activate particularistic considerations (Konrad & Pfeffer 1990). Under experimental conditions, subjects were more likely to base their decisions about whom to hire on criteria of social similarity to themselves when information used to make decisions and the identity of the decision-maker were secret (Salancik & Pfeffer 1978). Since scientists are predominantly male and white, decisions based on social similarity will reproduce their personal characteristics. Openness and due-process procedures entail an accountability in decision-making that reduces the use of social similarity in hiring choices. This is consistent with conformity studies which show that when behaviors are public, compliance with normative standards increases (Kiesler & Kiesler 1969).

The issues can be assessed with investigations that examine allocations of positions and rewards under variable organizational and group conditions of openness and due process. As one example, Cole (1992:185–88) considers the use of particularistic network ties under conditions of secrecy.

METHODOLOGICAL PROBLEMS[8]

Research on factors that account for sex and minority differences in career outcomes is fragmented and sometimes contradictory. To advance research in this area, future research should consider a set of common methodological problems. We hasten to add that while this section is necessarily critical, its purpose is not to dismiss prior research. We hope to positively influence research on women and minorities in science by considering five problems: 1) incomplete specifications; 2) aggregation over time; 3) assumptions of uniform effects and overgeneralization; 4) sampling on the dependent variable; and 5) problems in measurement.

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[8] The discussion of methodological problems draws from Long (1987).

Incomplete or Atheoretical Specifications

Research designs that leave out variables that are known to be causally relevant and theoretically central can only describe distributions, but cannot explain how those distributions are generated. A trade-off exists between the size of a sample and the richness of information collected. Large samples allow one to precisely estimate the distribution of outcomes, but unless critical independent variables are included in the study, satisfactory explanations of what generates those distributions are unlikely. As noted earlier, the method of residuals depends critically on controlling for relevant variables.

Consider research on academic rank. While the underrepresentation of women in higher ranks is undisputed, explanations are unclear. Examining rank without knowing the type of institution or the prestige of the department in which the rank is held provides an incomplete picture of a scientist's location in the stratification system. Even if women were equally represented in higher ranks, if they were predominantly in lower prestige institutions, our understanding would be incomplete. Further, without controlling for time since the doctorate, it is impossible to determine if their absence from higher ranks is proportional to their lesser seniority. Similarly, given that rank advancement in graduate programs should be strongly influenced by research productivity and given that women and minorities are known to be less productive as groups, assessments of particularism in rank advancement must control for productivity.

Aggregation Over Time

The scientific career should be viewed as a sequence of events occurring at unique times for each individual. Here we can benefit from the insights of "life course analysis" as discussed above. In the life course both the timing and the occurrence of events are important. The greatest insights are likely to be obtained from panel designs in which a sample of scientists are followed through time, from entrance into graduate school, through graduate school, and through employment for the rest of their careers.

For example, consider the relationship between recognition and performance. Because of processes of cumulative advantage and the reciprocal relationships between performance and recognition, understanding requires longitudinal evidence. While women as a group are less productive and generally hold less prestigious positions, we cannot conclude that they hold less prestigious positions due to their lower productivity. Research has shown that position affects productivity. If less productive women are in less prestigious positions, it is unclear whether the lower productivity resulted from being forced into a position less conducive to research (perhaps as a result of discrimination) or whether the less prestigious position resulted from poor performance. Assessments of discrimination and of universalism in science can best be made with longitudinal data that allow assessment at each step of the career.

Assumptions of Uniform Effects and Overgeneralization

Misleading conclusions can result from the implicit assumption that effects are uniform across disciplines, cohort, sector of employment, sex, or race. Care must be taken in citing a result based on scientists in a particular field at a particular time and not presenting the result as though it characterizes all fields, times, races, and sexes. For example, data on one minority group should not be generalized across all minority groups, since minority groups differ in their experience, and generalizations obscure our understanding of this variation. When studies include multiple disciplines, cohorts, sectors, sexes, or races, care must be taken in how these groupings are specified in the models used.

For example, consider an analysis of the prestige of academic appointment as the outcome with sex and productivity as the independent variables. If the model is specified as $\text{PRESTIGE} = \beta + \beta_{\text{SEX}}\text{SEX} + \beta_{\text{PROD}}\text{PROD} + \varepsilon$, it is misleading to assess the effect of sex on prestige based on the coefficient β_{SEX} since the model assumes that the way in which productivity affects prestige is identical for men and women. It is possible that men receive a greater return for productivity (e.g. for each additional paper, they get a greater increment in prestige) than do women. Failing to allow effects to differ by sex or race can mask important sex- or race-specific effects. Models should allow the effects of key variables to differ across groups, unless there are compelling reasons to suggest that the effects are uniform. Support for particularism can be found from differences in the intercepts, as with the traditional method of residuals, as well as from differences in the coefficients relating performance to recognition.

Sampling on the Dependent Variable

Many studies of stratification in science are based on nonrepresentative samples, and often on samples of elite scientists. This may be appropriate when we want to study the factors affecting those who have been the most successful (e.g. studies of Nobel Laureates). However, problems occur when results based on a nonrepresentative sample are generalized to all scientists. Within the statistics literature, the analysis of nonrepresentative samples is referred to as sample selection bias (Winship & Mare 1992). The statistical consequences of sampling on the dependent variable are that inferences from the nonrepresentative samples do not generally apply to the population as a whole.

For example, consider the effects of having children on achievement in science. It is possible that having young children affects the career differently at different stages. Having young children may affect a woman's decision or opportunities to pursue a tenure-track academic position. Women with young children may choose not to pursue such positions, and those hiring may particularistically decide that women with young children should not be considered for employment. Even so, some women with young children may for exceptional reasons obtain prestigious appointments. Analyses based on successful women might find that the presence of young children has no effect on their productivity. However, if the entire sample of women were analyzed, an effect of children might be found.

The analysis of nonrepresentative samples may occur in subtle ways even when the attempt is to obtain a representative sample. Consider a sample defined in terms of those obtaining degrees in a particular field over a particular period of time. Those women who change their name after receipt of the degree because of marriage, divorce, or changing norms may "disappear" later in the career since their name is unknown. If those lost are disproportionately those who changed names, the sample will not be representative.

Problems in Measurement

The use of measures that have differential validity or reliability by sex or race can generate spurious findings. To take one example, consider the measurement of productivity based on counts of first-authored papers. Such measures are common when using *SCI* since papers are not indexed for junior authors. To the extent that coauthorship patterns differ by sex or race, artificial sex or race differences in productivity may be found.

A very difficult measurement problem in assessing particularism and universalism involves the ambiguous meaning of common indicators of achievement and ascription. Particularism is said to operate when factors other than achievement affect recognition. If we want to study initial job placement, we would want to consider the effects of doctoral origins. If those with more eminent mentors and those from more prestigious graduate programs receive more prestigious jobs does this suggest universalism or particularism? To the extent that more eminent mentors and more prestigious programs train students better, the allocation is universalistic, rewarding the students for their greater potential. However, if the allocation is simply based on an "old boys" network, the allocation is particularistic. Many common measures used in studies of the scientific career are inherently ambiguous. Subtle designs and analyses are necessary to tease out the processes that are at work.

SUMMARY AND CONCLUSIONS

It is clearly established that women and most minorities are less likely to participate in science, have less prestigious positions, have lower productivity, and have less recognition. While understanding of the processes leading to these differential outcomes is incomplete, our review indicates that universalism falters in science. In some processes, such as rank advancement, being a woman or a minority may have negative effects. In other processes, women (the evidence for minorities is lacking) are less able to translate their productivity into resources and recognition. Qualitative studies point to many examples, both subtle and blatant, in which members of underrepresented groups did not receive due recognition or rewards. It is not enough to ask whether particularism or universalism operates in science, for few would maintain that science is wholly the one or the other. Rather, given the patterns observed, it is important to understand more fully the processes leading to the lower participation and performance of women and minorities in science. We hope that our review will contribute to future research in this area.

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Literature Cited

Ahern NC, Scott EL. 1981. *Career Outcomes in a Matched Sample of Men and Women PhDs* Washington: Natl. Acad. Press

Ainley MG. 1990. *Despite the Odds: Essays on Canadian Women and Science*. Montreal. Vehicle

Allison PD, Long JS. 1990. Departmental effects on scientific productivity. *Am. Sociol. Rev.* 55:469–78

Allison PD, Stewart JA. 1974. Productivity differences among scientists: evidence for accumulative advantage. *Am. Sociol. Rev.* 39: 596–606

Astin HS. 1969. *The Woman Doctorate in America: Origins, Career and Family*. New York: Russell Sage Found.

Astin HS, Davis DE. 1985. Research productivity across the career- and life-cycle In *Scholarly Writing and Publishing: Issues, Problems, and Solutions*, ed. MF Fox, pp. 147–60. Boulder, CO. Westview

Bayer AE, Folger JF. 1966. Some correlates of a citation measure of productivity in science. *Sociol. Educ.* 39:381–89

Bechtel HK. 1989. Introduction. In *Blacks, Science, and American Education*, ed. W Pearson, HK Bechtel, 1–20. New Brunswick: Rutgers Univ. Press

Beyer JM. 1978. Editorial policies and practices among leading journals in four scientific fields. *Sociol. Q.* 19:68–88

Blalock, HM Jr. 1967 *Toward a Theory of Minority-Group Relations*. New York: Wiley

Blau PM, Duncan OD. 1967. *The American Occupational Structure*. New York: Wiley

Bowen HR, Schuster JH. 1986. *American Professors*. New York: Oxford Univ. Press

CEEWISE (Committee on the Education and Employment of Women in Science and Engineering), National Research Council. 1979. *Climbing the Academic Ladder: Doctoral Women Scientists in Academe*. Washington, DC: Natl. Acad. Sci.

Centra JD 1974. *Women, Men, and the Doctorate*. Princeton: Educ. Testing Serv.

Chubin DE. 1974. Sociological manpower and womanpower: sex differences in career patterns of two cohorts of American doctorate scientists. *Am. Sociologist* 9:83–92

Clark BR. 1987. *The Academic Life: Small Words, Different Worlds*. Princeton, NJ: Princeton Univ. Press

Coggeshall PE. 1981. *Postdoctoral Appointments and Disappointments*. Washington: Natl. Acad.

Cole JR. 1979. *Fair Science: Women in the Scientific Community*. New York: Free

Cole JR, Cole S. 1973. *Social Stratification in Science*. Chicago: Univ. Chicago Press

Cole JR, Zuckerman H. 1984. The productivity puzzle: persistence and change in patterns of publication among men and women scientists. In *Advances in Motivation and Achievement*, ed. P Maehr, MW Steinkamp, pp. 217–56. Greenwich, CT: JAI

Cole JR, Zuckerman H. 1987. Marriage and motherhood and research performance in science. *Sci. Am.* 256:119–25

Cole S. 1992. *Making Science: Between Nature and Society*. Cambridge, MA: Harvard Univ. Press

Cole S, Fiorentine R. 1991. Discrimination against women in science: the confusion of outcome with process. In *The Outer Circle: Women in the Scientific Community*, ed. H Zuckerman, JR Cole, JT Bruer, pp. 205–26. New York: Norton

Commission on Professionals in Science and Technology (CPST). 1989. *Professional Women and Minorities: A Manpower Data Resource Service, 8th* Washington, DC

Commission on Professionals in Science and Technology (CPST). 1994. *Professional Women and Minorities: A Total Human Resource Data Compendium, 11th.* Washington, DC

Crane D. 1965. Scientists at major and minor universities: a study in productivity and recognition. *Am. Sociol. Rev.* 30:699–714

Deaux K, Emswiller T. 1974. Explanations of successful performance in sex-linked tasks. *J. Personality Soc. Psychol.* 22:80–85

Duncan OD. 1968. Inheritance of poverty or inheritance of race? In *On Understanding Poverty*, ed. DP Moynihan, pp. 85–110. New York: Basic

Elder GH. 1978. Family history and the life course. In *The Family and the Life Course in Historical Perspective*, ed. TK Hareven, pp. 17–64. New York: Academic

Elder GH. 1992 Life Course. In *Encyclopedia of Sociology*, ed. E Borgatta, M Borgatta, pp 1120–30. New York: Macmillan

Epstein CF. 1986 *Women in Law* New York: Anchor

Fechter A. 1989. A statistical portrait of black PhDs. In *Blacks, Science, and American Education*, ed. W Pearson, HK Bechtel, pp. 79–101 New Brunswick: Rutgers Univ. Press

Festinger L. 1954. A theory of social comparison processes. *Hum. Relat.* 7:117–40

Fox MF. 1983. Publication productivity among scientists: a critical review. *Soc. Stud. Sci.* 13:285–305

Fox MF. 1991. Gender, environmental milieu, and productivity in science. In *The Outer Circle: Women in the Scientific Community*, ed. H Zuckerman, JR Cole, JT Bruer, pp. 188–204. New York: Norton

Fox MF. 1992. Research productivity and the environmental context. In *Higher Education: The United Kingdom and the United States*, ed. T Whiston, R Geiger, pp. 103–11. Buckingham, Engl.: Soc. Res. into Higher Educ./ Open Univ. Press

Fox MF. 1994. *Gender and research productivity: the role of background and family status characteristics.* Pres. meet. Am. Assoc. for the Advance Sci. San Francisco, CA

Fox MF. 1995. Women and scientific careers. In *Handbook of Science and Technology Studies*, ed. S Jasanoff, GE Markle, JC Petersen, T Pinch, pp. 205–23. Thousand Oaks, CA: Sage

Fox MF. 1996. Women, academia, and careers in science and engineering. In *The Equity Equation: Women in Science, Engineering, and Mathematics*, ed. CS Davis, A Ginorio, C Hollenshead, B Lazarus, P Rayman. San Francisco: Jossey-Bass

Fox MF, Faver C. 1985. Men, women, and publication productivity. *Sociol. Q.* 26:537–49

Garfield E. 1981. The 1980 Nobel prizewinners. *Curr. Comments* 31:5–17

Gaston J. 1978. *The Reward System in British and American Science*. New York: Wiley

Gornick V. 1990. *Women in Science*. New York: Simon & Schuster. Rev. ed.

Grant L, Ward KB, Forshner C. 1993. *Mentoring, gender, and careers of academic scientists* Pap. pres. at meet. Am. Educ. Res. Assoc. Atlanta [ERIC document ED 361 299]

Hagstrom WO. 1965. *The Scientific Community*. New York: Basic

Hagstrom WO. 1967. *Competition and Teamwork in Science. Final Rep National Science Foundation for Research Grant GS-657*

Hagstrom WO. 1971. Inputs, outputs, and the prestige of university science departments. *Sociol. Educ.* 44:375–97

Hamovitch W, Morganstern RD 1977. Children and the productivity of academic women. *J. Higher Educ.* 48:633–45

Harding S 1986. *The Science Question in Feminism*. Ithaca, NY. Cornell Univ. Press

Hargens LL. 1969. Patterns of mobility of new ph.d.'s among American academic institutions *Sociol. Educ.* 42:18–37

Hargens LL, Hagstrom WO. 1967. Sponsored and contest mobility of American academic scientists. *Sociol. Educ.* 40:24–38

Hargens LL, Hagstrom WO. 1982. Consensus and status attainment patterns in scientific disciplines. *Sociol. Educ.* 55:183–96

Hargens LL, McCann J, Reskin BF. 1978. Productivity and reproductivity: marital fertility and professional achievement among research scientists. *Soc. Forc.* 52:129–46

Helmreich RL, Spence JT, Beane WE, Lucker GW, Matthews KA. 1980. Making it in academic psychology: demographic and personality correlates of attainment. *J. Personality Soc. Psychol.* 39:896–908

Hornig LS. 1987. Women graduate students. In *Women: Their Underrepresentation and Career Differentials in Science and Engineering*, ed. LS Dix, pp. 103–22. Washington, DC: Natl. Res. Council

Hurlbert J, Rosenfeld RA. 1992. Getting a good job: rank and institutional prestige in academic psychologists' careers. *Sociol. Educ.* 65:188–207

Kass-Simon G, Farnes P, ed. 1990. *Women of Science: Righting the Record*. Bloomington, IN: Ind. Univ. Press

Keller EF. 1985. *Reflections on Gender and Science*. New Haven: Yale Univ. Press

Keller EF. 1991. The wo/man scientist: issues of sex and gender in the pursuit of science. In *The Outer Circle: Women in the Scientific Community*, ed. H Zuckerman, JR Cole, JY Bruer, pp. 227–36. New York: Norton

Kiesler CA, Kiesler SB. 1969. *Conformity*. Reading, MA: Addison-Wesley

Konrad AM, Pfeffer J. 1990. Do you get what you deserve? Factors affecting the relationship between productivity and pay. *Admin. Sci. Q.* 35:258–85

Long JS. 1978. Productivity and academic position in the scientific career. *Am. Sociol. Rev.* 43:899–908

Long JS. 1987. Problems and prospects for research on sex differences. In *Women: Their Underrepresentation and Career Differentials in Science and Engineering*, ed. LS Dix, pp. 157–69. Washington, DC: Natl. Acad.

Long JS. 1990. The origins of sex differences in science. *Soc. Forc.* 68:1297–1315

Long JS. 1992. Measures of sex differences in scientific productivity. *Soc. Forc.* 71:159–78

Long JS, Allison PD, McGinnis R. 1979. Entrance into the academic career. *Am. Sociol. Rev.* 44:816–30

Long JS, Allison PD, McGinnis R. 1993. Rank advancement in academic careers: sex differences and the effects of productivity. *Am. Sociol. Rev.* 58:703–22

Long JS, McGinnis R. 1981. Organizational contexts and scientific productivity. *Am. Sociol. Rev.* 46:422–42

Long JS, McGinnis R. 1985. The effects of the mentor on the academic career. *Scientometrics* 7:255–80

Mackie M. 1977. Professional women's collegial relations and productivity. *Sociol. Soc. Res.* 61:277–93

Marwell G, Rosenfeld RA, Spilerman S. 1979. Geographic constraints on women's careers in academia. *Science* 205:1225–31

Merton RK. [1942] 1973. The normative structure of science. In *The Sociology of Science*, pp. 267–78. Chicago: Univ. Chicago Press

Merton RK. [1968] 1973. The Matthew effect in science. In *The Sociology of Science*, pp. 439–59. Chicago: Univ. Chicago Press

Mitroff II. 1974. Norms and counternorms in a select group of Apollo moon scientists: a case study in the ambivalence of scientists. *Am. Sociol. Rev.* 39:379–95

Moen P. 1985. Continuities and discontinuities in women's labor force activity. In *Life Course Dynamics*, ed. GH Elder, pp. 113–55. Ithaca, NY: Cornell Univ. Press

Mulkay M. 1976. Norms and ideology in science. *Soc. Sci. Inform.* 15:627–36

Mulkay M. 1979. *Science and the Sociology of Knowledge*. London: Allen & Unwin

Nakao K, Treas J. 1995. Updating occupational prestige and socioeconomic scores: how the new measures measure up. *Sociol. Methodol.* In press

National Research Council, Committee on the Education and Employment of Women in Science and Engineering. 1979. *Climbing the Academic Ladder: Doctoral Women Scientists in Academe*. Washington, DC: Natl. Acad.

National Research Council, Committee on the Education and Employment of Women in Science and Engineering. 1983. *Climbing the Ladder: An Update on the Status of Doctoral Women Scientists and Engineers*. Washington, DC: Natl. Acad.

Nieva V, Gutek B. 1980. Sex differences in evaluation. *Acad. Manage. Rev.* 5:267–76

Parsons T, Shils EA. 1951. *Toward a General Theory of Action*. Cambridge, MA: Harvard Univ. Press

Pearson W. 1985. *Black Scientists, White Society, and Colorless Science: A Study of Universalism in American Science*. Millwood, NY: Assoc. Faculty

Pearson W. 1987. The graduate education and careers of underrepresented minorities in science and engineering. In *Minorities: Their Underrepresentation and Career Differentials in Science and Engineering*, ed. LS Dix, pp. 133–49. Washington: Natl. Acad.

Pearson W. 1988. The role of colleges and universities in increasing black representation in the scientific professions. In *Toward Black Undergraduate Student Equality in American Higher Education*, ed. M Nettles, AR

Thoeny, pp. 105–24. Greenwich, CT: Greenwood

Pearson W, Bechtel HK. 1989. ed. *Blacks, Science, and American Education*. New Brunswick, NJ: Rutgers Univ. Press

Pfeffer J, Salancik GR, Leblebici H. 1976. The effect of uncertainty on the use of social influence in organizational decision making. *Admin. Sci. Q.* 21:227–45

Pheterson GT, Kiesler SB, Goldberg PA. 1971. Evaluation of the performance of women as a function of their sex, achievement, and personal history. *J. Personality Soc Psychol.* 19:110–14

Price, DJS. 1963. *Little Science, Big Science*. New York: Columbia Univ. Press

Primack RB, O'Leary VE. 1989. Research productivity of men and women ecologists: a longitudinal study of former graduate students. *Bull. Ecol. Soc. Am.* 70:7–12

Reskin BF. 1977. Scientific productivity and the reward structure of science. *Am. Sociol. Rev.* 42:491–504

Reskin BF. 1978a. Scientific productivity, sex, and location in the institution of science. *Am. J. Sociol.* 83:1235–43

Reskin, BF. 1978b. Sex differentiation and the social organization of science. In *The Sociology of Science*, ed. J Gaston, pp. 6–37. San Francisco: Jossey-Bass

Reskin BF. 1979. Academic sponsorship and scientists' careers. *Sociol Educ.* 52:129–46

Reskin BF, Hargens LL. 1979. Scientific advancement of male and female chemists. In *Discrimination in Organizations*, ed. KG Lutterman, pp. 100–22. San Francisco: Jossey-Bass

Rosen B, Jerdee TH. 1974. Influence of sex-role stereotypes on personnel decisions. *J. Appl. Psychol.* 59:9–14

Rosenfeld RA. 1981. Academic men and women's career mobility. *Soc Sci. Res.* 10: 337–63

Rosenfeld RA. 1991. *Outcomes analysis of academic careers*. Prep for Off. Scientif. Engin. Personnel, Natl. Res. Council

Rosenfeld RA, Jones JA. 1986. Institutional mobility among academics. *Sociol. Educ.* 59. 212–26

Rossiter M. 1982. *Women Scientists in America: Struggles and Strategies to 1940*. Baltimore: Johns Hopkins Univ. Press

Salancik GR, Pfeffer J. 1978. Uncertainty, secrecy, and the choice of similar others. *Soc. Psychol.* 41:246–55

Seldin P. 1984. Faculty evaluation: surveying policy and practices. *Change* 16:29–33

Shenhav Y, Haberfeld Y. 1988. Scientists in organizations: discrimination processes in an internal labor market. *Sociol. Q.* 29:451–62

Sonnert G. 1990. *Careers of women and men postdoctoral fellows in the sciences*. Pap. pres. meet. Am. Sociol. Assoc. Wahington, DC

Tang J. 1993. The career attainment of Caucasian and Asian engineers. *Sociol. Q.* 34:467–96

Vetter BM. 1981. Women scientists and engineers: trends in participation. *Science* 214: 1313–21

Ward KB, Grant L. 1995. Gender and academic publishing. In *Higher Education: Handbook of Theory and Research*, Vol. 11, ed. AE Bayer, JC Smart. New York: Agathon

Winship C, Mare RD. 1992. Models for sample selection bias. *Annu. Rev. Sociol.* 18:327–50

Wolfle D. 1972. *The Home of Science*. New York: McGraw-Hill

Yoels WC. 1974. The structure of scientific fields and the allocation of editorships on scientific journals: some observations on the politics of knowledge. *Sociol. Q.* 15:264–76

Zuckerman H. 1970. Stratification in American science. In *Social Stratification*, ed. EO Laumann, pp. 235–57. Indianapolis: Bobbs-Merrill

Zuckerman H. 1977. *Scientific Elite: Nobel Laureates in the United States*. New York: Free

Zuckerman H. 1988. The sociology of science. In *Handbook of Sociology*, ed. NJ Smelser, pp. 511–74. Newbury Park, CA: Sage

Zuckerman H, Cole JR. 1975. Women in American science. *Minerva* 13:82–102

Zuckerman H, Cole JR, Bruer JT. eds. 1991. *The Outer Circle: Women in the Scientific Community*. New York: Norton

Zuckerman H, Merton RK. [1972] 1973. Age, aging, and age structure in science. In *The Sociology of Science*, pp. 497–559. Chicago: Univ. Chicago Press

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BEYOND RATIONALITY IN MODELS OF CHOICE

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ABSTRACT

There is increasing sociological interest in formal models of action driven by a calculus of expected utility. We believe these efforts to extend microeconomic models to extraeconomic exchange can benefit from specification of societal constraints on individual choice. One type of constraint locates the actor in an evolving network of social ties that limit opportunities for exchange. Another approach assumes that choices are influenced by unintended outcomes that operate behind the backs of the actors. Considerable progress has been made in the past two years incorporating social structure and unintended consequences into formal models based on individual choice optimization. We critically examine leading contributions to network exchange theory (part 1) and evolutionary models of collective action (part 2), and assess how these and related developments may shape the future of rational choice theory and its place within sociology.

BEYOND RATIONALITY IN MODELS OF CHOICE

The economist James Duesenberry (1960, p. 233) wrote that "economics is all about how people make choices; sociology is all about how people don't have any choices to make." This chapter surveys recent efforts to bridge the gap

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between structure and action with formal microsocial theories that constrain choice but preserve agency.

Microeconomic theory explains the exchange of resources as a process of optimization driven by calculations of expected marginal utility. By assuming a set of preferences and sufficient information for actors to calculate the marginal returns on competing investments, economic theory can generate rigorously testable, nontautological hypotheses about market behavior.

The rigor, parsimony, and analytic power of rational choice has prompted sociologists to extend the theory beyond market transactions to exchanges of symbolic and nonfungible resources such as social approval, security, and even love (Becker 1991, Coleman 1990, Hechter 1987). These extensions invite considerable skepticism. Critics warn that efforts to accommodate rational choice theory to nonmaterial and nonfungible exchanges may rob the theory of its rigor and falsifiability and lead to "theoretical indeterminacy" (Smelser 1992, p. 402). The theory may become "an inclusive and universally applicable construct that simultaneously explains everything and therefore nothing" (p. 403).

This problem of indeterminacy has attracted theoretical interest in societal constraint on individual choice. One type of constraint locates the actor in an evolving network of social ties that limit opportunities for exchange. Another approach assumes that choices are influenced by unintended outcomes that operate behind the backs of the actors. Considerable progress has been made in the past two years incorporating social structure and unintended consequences into formal optimization models driven by individual choice. This chapter critically examines leading contributions to network exchange theory (part 1) and evolutionary models of collective action (part 2) and then assesses how these and related developments may shape the future of rational choice theory and its place within sociology.[1]

Clearly, the effort to restrict the latitude for action inherited from microeconomics might lead to theories that eclipse human agency and return us to a structural-functionalist macrosociology in which actors are but the incumbents of social positions or systemic imperatives. However, we believe these newly developing lines of inquiry promise to make formal theories of human agency more useful and compelling to scholars interested in noneconomic and symbolic exchange.

[1] The works we review address groups that are small enough that the actions of each have nontrivial effects on others. We exclude corporate actors and macro level processes, such as states and state systems, mass mobilizations, and large formal organizations. Recent developments in macro-level rational choice theory will be addressed by Michael Hechter in the 1996 *Annual Review of Sociology*. At the other end of the spectrum, pioneering efforts to use machine intelligence to simulate micro-level decision-making were reviewed by Bainbridge et al in the 1994 *Annual Review*. Our survey bridges these two articles.

NETWORK EXCHANGE: FROM MACRO TO MICRO AND BACK

The incorporation of structural constraint into microsocial models of action bridges three long-standing research traditions that have developed in relative isolation: structural analysis, social exchange theory, and the literature on collective action.

Network Structure and the Distribution of Power in Social Exchange

Network Exchange Theory (NET) is the most fully elaborated formal effort to link structural sociology with a theory of action. Theoretical and empirical interest centers on the distribution of power in a network of social ties that limit opportunities for exchange. The theory builds on two earlier lines of inquiry, the classical social exchange theory of Homans (1961), Emerson (1972a,b), and Blau (1964) and the structural network analysis of White et al (1976), Marsden (1983), and others. Structural network analysis has rigorously modeled alternative configurations of social ties, but without an explicit and coherent model of action, a model of "the content of the tie or social relationship" (Cook & Withmeyer 1992, p. 123).

In contrast, early social exchange theorists explicitly modeled social relations as mutually profitable resource transfers conducted by self-interested actors. Blau, for example, used a microeconomic model of action, while Homans and Emerson assumed actors are guided by behavioral principles of reinforcement. However, while classical exchange theorists modeled network structure as a constraint on exchange opportunities, the effects of structural variation have only recently begun to be systematically explored. In addition, the classical models did not allow actors to manipulate social ties to enhance their bargaining positions.

NET aims to integrate systematically the structural embeddedness of actors into choice-driven explanations of both individual behavior and effects of structure on outcomes. The fundamental premise is that, ceteris paribus, the greater an actor's exchange opportunities, the greater the bargaining power. However, more restricted specifications of structural effects are required to make precise predictions for the outcome of bargaining games under controlled laboratory conditions. Using laboratory experiments with human subjects, Skvoretz & Willer (1993) tested four competing NET models about the distribution of power in exchange networks. The four theories—core, equidependence, expected value, and resistance—agree that bargaining power will reflect differences in vulnerability to exclusion from exchange. However, they differ in the magnitude and structural location of the predicted inequalities.

Core theory (Bienenstock & Bonacich 1993) analyses the bargaining process as a cooperative N-person game among strictly maximizing rational strategists. A core solution refers to a coalition of exchange partners for which no alternative coalition could earn a higher payoff through a different configuration of exchanges. However, without additional, extra-rational behavioral assumptions, core theory cannot predict unique distributional outcomes of a given network configuration (Skvoretz & Willer 1993, p. 804).

Competing network exchange theories reduce this indeterminacy by imposing additional assumptions, beyond the paradigmatic axiom of rational egoism. In expected value theory, actors adjust their bargaining positions based on their sense of dependence on a particular exchange. Hence, the relative bargaining power of two potential interactants depends on their relative number of alternative exchange partners (Friedkin 1992).

Equidependence theory (Cook & Yamagishi 1992) assumes that the terms of exchange between two trading partners reflect the next-best alternatives of each (their "comparison levels"). Each side ends up better off, by an identical amount, than they would be if they were each to exchange instead with their next-best alternative.

Finally, in exchange-resistance theory (Markovsky et al 1993, Skvoretz & Willer 1993), actors adjust their bargaining positions downward in response to exclusion and upward in response to inclusion. Distributional outcomes then depend on the relative vulnerability to exclusion. This led Markovsky's team to the discovery of "weak" and "strong" power. "[S]trong power structures guarantee that one or more actors will be excluded by another actor who is never excluded. Weak power structures ensure that either all positions are prone to exclusions… or that no position… is assured of being able to exclude another without cost. Thus, the certainty of exclusions in strong power networks is replaced by the possibility of exclusions in weak power networks" (Markovsky et al 1993, p. 202).

Skvoretz & Willer (1993) tested the ability of these alternative models to predict the behavior of human subjects in controlled bargaining experiments. These experiments presented subjects with the problem of dividing a fixed number of payoff points with an exchange partner. They found stronger support for expected value and exchange-resistance models than for core or equidependence models. However, Bienenstock & Bonacich (1993) have recently extended their game-theoretic models to include solutions based on the "shapley value" (Rapoport 1970) and "kernel" (Kahan & Rapoport 1984), which reduce core theory's indeterminacy and provide a greatly improved fit with experimental results (1993, p. 133).

Whatever their relative explanatory power, all four NET models show how microsocial theories of action can be integrated with structural theory to produce rigorously testable hypotheses with surprisingly accurate empirical predictions. These efforts show how "accounting for decisions and behaviors at the levels of individuals and relations can improve our understanding of structural effects, and that only by accounting for structural contingencies can lower level processes and outcomes be fully comprehended" (Markovsky et al 1993, p. 208).

Collective Action and Exchange Structure

Until recently, this line of inquiry has remained isolated from the broader rational choice literature on social dilemmas and collective action. Network exchange studies have generally focused on opportunities for mutual gain. Although the terms of exchange may be one-sided, there is no possibility of betrayal or fear of being suckered. Hence, exchange can be expected to occur so long as neither side has alternative trading partners.

This focus on mutual gain excludes the problems of trust and betrayal in many social exchanges. Although both parties may prefer mutual gain to exclusion, each is confronted with two additional motives: the temptation to cheat and the fear of being suckered. Extensive experimental research on dyadic exchange has shown how fear and greed can impair actors' abilities to achieve mutually profitable cooperation in social dilemmas (Liebrand et al 1992, p. 15). Hence, contrary to NET, even without alternative trading partners, actors may nevertheless fail to exchange.

While NET excludes the problem of cheating, the social dilemma literature typically ignores the structure of social ties among members of the interest group. Most collective action studies assume each actor exchanges a private resource for a share in a public good provided by the group. The social dilemma arises because the public good cannot be excluded from noncontributors; hence, each member is tempted to let others shoulder the cost and fears being a chump. However, the assumption that each member exchanges with the group at large "ignores the internal structure of the social contexts in which such dilemmas arise" (Yamagishi & Cook 1993, p. 235).

Yamagishi & Cook (1993) have recently moved to bring these research lines together. Following Ekeh (1974), they distinguished between "generalized exchange" (as assumed in the rational choice literature on collective action) and "restricted exchange" (as assumed in both NET and traditional social exchange theory). The distinction centers on "whether a direct give-and-take relationship exists between two partners" (Yamagishi & Cook 1993, p. 235). Ekeh argued that generalized exchange does not entail strict reciprocity, and this promotes mutual trust and solidarity among participants (p. 237). However, Yamagishi & Cook countered that this depends on the structure of social ties. Generalized exchange need not be groupwise but may instead involve unidirectional dyadic ties, a pattern they call "network-generalized exchange," such as a "three-person unidirectional chain in which Member A benefits B, B benefits C and C benefits A" (p. 237). Yamagishi & Cook give the example of a motorist stranded by the roadside. Those who stop to help may someday be helped by others, but it is unlikely to be the same person they assisted. They also give the example of "a network of 'weak ties' characterized by the unidirectional flow of information, if we may build on Granovetter's (1973) work" (p. 238). These weak ties "may be considered a network-generalized exchange structure, whereas a network of strong ties containing a bidirectional flow of information may be considered a restricted exchange structure" (p. 238).

So how does the network-generalized exchange structure differ from the typical collective action problem? Yamagishi & Cook posit two key advantages of network-generalized over group-generalized exchange, one based on the assumption of fully rational strategic action, the other based on extra-rational considerations. The strategic argument is the fear that free-riding may "make everyone in the system stop cooperating" (p. 240). Hence, "group-generalized exchange involves the incentive structure of an n-person prisoner's dilemma (nPD), whereas the network-generalized exchange [more closely] resembles the incentive structure of an n-person assurance game (nAG)" (p. 239).

Prisoner's Dilemma is a two-player game-theoretic representation of the problem of cooperation, trust, and betrayal. Each exchange partner has two choices, "cooperate" or "defect," which determine the payoffs: T and S for unilateral defection and cooperation, respectively, and P and R for bilateral. A Prisoner's Dilemma arises when $T>R>P>S$. The best choice for each side is always to defect, yet this pays each P, the next to worst possible outcome. However in an Assurance Game, the payoffs are $R>T>P>S$. Now Ego's best strategy depends on whether Alter is expected to cooperate, hence the importance of trust among fully rational strategists.

Yamagishi & Cook also hypothesized extra-rational reasons for greater cooperation in network-generalized over group-generalized exchange, based on "each participant's subjective efficacy or diffusion of responsibility.... Participants in the group-generalized exchange structure will believe that their actions affect each of the other participants less seriously than in the network-generalized exchange structure. In other words, participants will feel less responsibility for the benefits that each of the other participants receives" (p. 240).

Yamagishi & Cook were thus led to hypothesize higher cooperation in network-generalized than in group-generalized exchange structures, higher cooperation among high-trust than low-trust actors, and stronger effects of trust in network-generalized exchange. These hypotheses were tested using laboratory experiments with human subjects. They found highly significant effects of exchange structure and trust, as well as their interaction, all in the predicted direction.

Cooperation in group-generalized exchange may be less difficult than Yamagishi & Cook's findings suggest. In a new book, Marwell & Oliver (1993) argued that free-riding and diffusion of responsibility can be overcome in heterogeneous groups producing public goods with nonlinear production functions and jointness of supply—conditions Yamagishi & Cook neglected in their analysis and experimental design. Jointness means that free-riders do not reduce the collective benefit to volunteers. Marwell & Oliver then showed how a hard core of highly interested and resourceful volunteers may be willing to shoulder the cost of the public goods themselves, rather than go without, no matter how many others get to enjoy the benefits for free. Moreover, public goods typically have an initially accelerating payback due to fixed start-up costs, such as organizational infrastructure. This means that a vanguard of sufficient size can create a "critical mass" that triggers a chain reaction by making additional contributions increasingly attractive to less committed members as these start-up costs are paid. Hence, contrary to Olson's (1965) logic of collective action in privileged groups, volunteers may actually reduce the temptation for others to free-ride.

This suggests that Yamagishi & Cook may have it backwards. As the jointness of supply and convexity of the production function increase, group-generalized exchange resembles an *n*-person Assurance Game, not a Prisoner's Dilemma. In contrast, network-generalized exchange has a linear production function (since benefits depend entirely on the decisions of a single exchange partner) and zero jointness (since free-riders benefit at a contributor's expense.)

Cooperation in group-generalized exchange can also depend decisively on the configuration of social ties and the flow of influence from vanguards to followers. Marwell & Oliver (1993) showed how successful collective action can benefit from centralized ties that facilitate "selectivity" by organizers—the identification and mobilization of a few key contributors.

Gould (1993) extended Marwell & Oliver's structural analysis by adding normative pressure to the rational influence of vanguard contributors. Gould hypothesized that each additional volunteer increases the normative pressure on holdouts, as well as enthusiasm about the prospects for success. These two concerns, in turn, prompt actors to emulate the efforts of volunteers. The contribution level is then bid upward, converging at an equilibrium given by the rate at which actors discount others' influence.

If actors "peg their contributions to the contributions they observe among their social contacts" (Gould 1993, p. 191), then the outcomes will depend on the configuration of network structure. Gould then showed how collective action can be facilitated by structural arrangements that minimize the "dilution" caused by social ties to nonvolunteers. He concluded, "Above all, the connection between network centralization and collective action highlighted by Marwell et al (1988), and the negative effect of "cliquishness" described by Macy (1991), are echoed here. Network centralization affects total contributions because of the competing influences of volunteers and shirkers on actors trying to match the average contribution of their peers. When the volunteer is a centrally located actor, high centralization means that most actors perceive a high average level of contribution because they are tied to relatively few shirkers (Gould 1993, p. 194).

In supplementing rational expectations of success with normative pressures, Gould assumes that shirkers influence those around them to refrain from contribution. A recent study by Heckathorn (1993) challenged this idea. Heckathorn attributed the application of moral pressure to an instrumental interest in getting other people to pay the cost of a nonexcludable benefit. Hence shirkers do not necessarily encourage dereliction. On the contrary, Heckathorn showed that sanctioning by free riders, although hypocritical, may nevertheless be decisive in jump starting collective action. Heckathorn then presented a sophisticated analysis of the effects of group heterogeneity—how a small but resourceful core group might pressure others to volunteer. Heckathorn thus solved the "second order free rider problem" (Oliver 1980) by showing that it can be cost-effective to invest in enforcement even when it is not cost-effective to invest in compliance. In groups stymied by the high startup costs of collective action, hypocritical enforcement can then provide the initial push that gets compliance up to the level at which contributions become self-sustaining. Nevertheless, unlike Gould, Heckathorn did not take into account how the spread of social influence might depend on the structure of social ties within the group.

Emergent Social Structure

Until recently, structural analyses informed by theories of choice, such as NET and the influence models proposed by Gould and by Marwell & Oliver, took as given the pattern of social ties among interdependent actors. However, recent contributions have made social structure an endogenous rather than exogenous constraint on behavior. The inquiry then addresses the emergence of social structure as the product of the interdependent choices of structurally constrained actors.

Leik (1992) has extended network exchange theory to include "strategic manipulation of network linkages." Leik assumed that actors strive to maximize power in the network. However, Leik relaxed the conventional NET assumption that the structure of exchange opportunities is constant over time. Instead, actors try to increase their opportunities for exchange, while trying to reduce the alternatives available to others (Leik 1992, p. 310).

Leik then studied the effects of "strategic manipulation" on network power differentials. He hypothesized that additional links will decrease power differentials only if the number of exchanges that are possible in one round does not exceed the number of exchanges possible in a fully connected network (p. 315). Moreover, "an occupant of a low power position will prefer to add one or more links to the network," while "an occupant of a high power position will prefer to delete one or more existing links in the network. In essence, low power positions need alternatives while high power actors prefer to isolate those dependent on them" (p. 316).

In another study, Zeggelink (1993) used computer simulation to model the emergence of a friendship network in a group of initial strangers. She assumed that actors strive to increase the number of their friends up to but not beyond an optimal point. Alter's friendship proposal is accepted if Ego is still below the optimum, otherwise it is rejected. The process is iterated until it reaches a stable equilibrium. Zeggelink then introduced two extensions of the model. First, she assumed that actors desire not only an optimal number of friends but also friends who are similar to themselves in some attribute that varies over the population (e.g. education or ethnicity). Second, actors prefer to be friends with the friends of their friends. Simulations showed that social heterogeneity, in combination with relatively large friendship optima, lowers total satisfaction, because members of the minority have difficulty finding sufficient friends like themselves. At the same time, desire for similarity in friendships fosters the emergence of a segmented network comprising homogeneous subgroups. Finally, when individuals strive to choose friends within their own subgroup, a group of initial strangers tends to become divided into members who interact and others who remain isolated and dissatisfied.

While most recent studies of emergent structure have used formal models, Kollock has investigated the problem experimentally (Kollock 1994). In his design, buyers and sellers are free to choose partners for mutually profitable transactions. Kollock hypothesized that uncertainty about the results of exchange will cause subjects to commit themselves to long term exchange relations with particularly trustworthy partners. However, when uncertainty is low, much less structural differentiation is expected to develop. The findings support the main hypothesis and suggest that in markets with imperfect information and high uncertainty, the structure of social ties that constrain exchange opportunities may be self-imposed by actors pursuing their self-interest. Rather than modeling network structure as a constraint on individual behavior, Kollock shows how social ties evolve in interaction with the choices they constrain.

To sum up, recent contributions have brought structural constraint to the forefront of models driven by individual choice. These efforts to move from macro to micro and back begin to bridge long-standing but previously isolated research traditions: structural network analysis, social exchange theory, and the literature on collective action. However, more work remains to be done to make the approaches fully compatible. Specifically, NET models social ties as the exchange of resources, while research on network effects in collective action (by Marwell & Oliver as well as Gould) conceptualizes social ties as channels for social influence rather than exchange. Yamagishi & Cook begin to integrate these two but only for a limited application.

The common element in these contributions is the limit of opportunity: what actors cannot choose. While this stands in striking contrast to conventional microeconomic models, the incorporation of structural constraint has not compromised the ability to formalize theories of individual choice that generate empirically testable propositions about collective outcomes.

THE EXPLANATORY POWER OF UNINTENDED CONSEQUENCES

A microsocial interest in societal constraint has also unfolded on a second front, the incorporation of unintended and unforeseen consequences into models of action. In these evolutionary models, choices are "hard-wired" by processes that operate behind the backs of the actors.

Evolutionary models, like rational choice, are consequentialist (Elster, 1989), that is, outcomes are used to explain the actions that bring them about. The problem with consequentialist explanations is temporal: how can the future influence the past? The solution in rational choice theory is the analytic ability to forecast returns on competing investments. Rational actors are forward-looking, purposeful, and analytic; they consciously and deliberately choose among alternatives based on expected outcomes. The outcomes that matter are not those that have occurred; indeed they need never occur. They need only to be expected.

Simply put, in rational choice theory, intentionality is the mechanism by which consequences can solicit the actions that produce them, bringing the future to bear on the present. Unintended outcomes have no explanatory power. Smith's "invisible hand" may produce mutually beneficial market outcomes, but it is not the baker's benevolence that explains the bread.

Numerous critics have suggested that this calculus of expected utility is at best a normative model of how decisions ought to be made, one that bears little resemblance to actual decision-making. Results from two decades of laboratory research led Orbell & Dawes to conclude that "experimental studies have challenged subjective expected utility as a descriptive model of human behavior, identifying a set of heuristics, or rules of thumb, that can be explained (and perhaps justified) insofar as they economize on cognitive effort" (Orbell & Dawes 1991, p. 517; see also Bell, Raifa, & Tversky 1988). Indeed, even many economists concede that utility-maximizing behavior describes the end result of market exchange but not the process by which it obtains (Winter 1986). The process is rather like that of an outfielder who catches a fly ball without the need to calculate its trajectory. Friedman defended this "as if" assumption on the grounds "that a theory cannot be tested by the 'realism' of its 'assumptions,'" but should be tested primarily by the relative accuracy of its predictions (Friedman 1953, pp. 17-23). The market selects optimal solutions through the relentless process of competition for survival. Suboptimal decisions are removed from the repertoires of the actors by learning and imitation, and any residuals are removed from the population by bankruptcy and takeover. We are then left with "rational" solutions that make their owners look much smarter than they really are, as if the eventual outcome was the one they had intended all along.

Back to the Future

These adaptive models of behavior require recurrent decisions but little cognitive sophistication or information. It is repetition, and not intention, that brings the future to bear on the present. The consequences that matter are those that have already occurred, not those the actors intend. Adaptive actors look forward by holding a mirror to the past. The optimizing process is backward-looking, not forward-looking; evolutionary, not analytic.

To sum up, in rational choice theory, unintended consequences have no explanatory power and repetition is unnecessary (though not precluded). In evolutionary theory, future outcomes have no explanatory power, and intention is unnecessary (though not precluded).[2]

Evolution is based on two types of environmental feedback, reproduction, which alters the frequency distribution of strategies within a population of actors, and reinforcement, which alters the probability distribution of strategies within the repertoire of each individual. In cultural evolution, reproduction typically occurs through role modeling (such as "imitation of the fittest") rather than survival. Since role modeling and learning are the stuff of socialization, the growing interest in maximization driven by unintended consequences promises to greatly reduce the tension (and often hostility) between rational choice theory and mainstream sociology. The analytic focus is shifted away from the calculus of marginal utility and towards the evolution of hard-wired cultural codes, including pragmatic or heuristic routines, social conventions, institutionalized rituals, moral habits, and normative rules.

The Evolution of Prosocial Behavior

This evolutionary approach is most advanced in the study of cooperation in social dilemmas, a field known as evolutionary game theory. Axelrod's (1984) celebrated "computer tournament" led to the proliferation of evolutionary contests among sets of strategies for playing iterated Prisoner's Dilemma. Axelrod showed how a strategy of TIT FOR TAT (or TFT) might gain a foothold in a world infested with predators and go on to flourish. TFT uses a simple rule: "cooperate on the first move and thereafter mimic your partner." The strategy is tough but fair. It never tries to exploit, is quick to forgive those who mend their ways, but never lets betrayals go unpunished. More aggressive strategies do better in a world filled with naive altruists, but by driving their prey to extinction, they dig their own graves. In contrast, TFT enjoys a decisive evolutionary edge: Unlike predators, it benefits through interacting with copies of itself.

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[2] Rational choice models with imperfect information may substitute experiential knowledge, but the possibility of hybrid models does not negate the distinction between forward-looking and backward-looking ideal types.

This finding has prompted numerous efforts to unseat TFT as the evolutionary winner. In the same month that Yamagishi & Cook's (1993) study appeared, Kollock (1993) published a related article on the evolutionary advantage of "relaxed" over "restrictive" exchange. For Kollock, restrictive exchange refers not to bidirectional dyadic ties but to strategies based on strict reciprocity, or TFT. In contrast, relaxed accounting systems resemble network-generalized exchange in the allowance for asymmetry between trading partners. However, relaxed exchange can occur even in purely dyadic relations if the actors are willing to overlook occasional transgressions and allow temporary debts to accumulate in long-term transactions. Although rules that are more forgiving and more generous are also more vulnerable to exploitation, they are less vulnerable to "echo effects" in which two would-be cooperators nevertheless exhaust themselves in an endless series of recriminations, as in a blood feud. Following Bendor (1987), Kollock hypothesized that in an uncertain world governed by norms of reciprocity, more forgiving exchange rules are less vulnerable to accidents or misunderstandings that might trigger a mutually destructive spiral of needless recrimination. And more generous rules are better able to recover should cooperation collapse.

Kollock then used computer simulations to test the hypothesized evolutionary robustness of relaxed exchange rules. In a population containing mainly conditionally cooperative strategies, the evolutionary edge can go to those who strike a more benevolent compromise between vulnerability to exploitation (if one is excessively tolerant of betrayal) and vulnerability to recrimination (if one is insufficiently tolerant).

Although provocative, Kollock's analysis has limited scope. The evolutionary advantage of relaxed exchange rules depends on two conditions. First, interactions must be dyadic. The findings do not apply to group-generalized exchange in which there is no way to target reciprocity effectively, precluding conditional cooperation (based on either relaxed or restricted rules). Second, the population must be heavily weighted toward conditional strategies. Nonconditional strategies (like naive cooperation, incorrigible predation, or random choice) are immune to the effects of forgiveness at all levels of noise, and this will enhance the robustness of strict reciprocity over more relaxed accounting systems.

Prisoner's Dilemma Without the Usual Suspects

Orbell & Dawes (1993) have argued that most people in Prisoner's Dilemma situations are not prisoners. They are free to walk away. Moreover, the exit payoff may often be preferred to the payoff when the partner defects. Schuessler (1989) and Vanberg & Congleton (1992) explored a conditionally cooperative strategy similar to TFT except that it prefers to exit rather than fight. Both studies used computer simulated evolution to demonstrate the robustness of this non-retaliatory rule and the importance of the exit option in the evolution of cooperation.

Orbell & Dawes took this approach a step further by showing how cooperation might evolve even in one-shot games, without Axelrod's (1984) "shadow of the future." In a game with an option not to play, naive cooperators will have a decisive advantage over incorrigible predators if both bias their expectations of others' behavior based on their own intentions. Cooperators will then prefer to participate in exchange more often than will predators, who prefer to exit rather than risk interaction with someone like themselves. This means that the population of exchange partners will have a higher proportion of cooperators than will the population overall, reducing the rate of exploitation and increasing the evolutionary chances of naively benevolent strategies.

Orbell & Dawes then used laboratory experiments with human subjects to test a key behavioral assumption, that those who intend to cooperate will play more often than will those who intend to defect. Using Prisoner's Dilemma games with and without an option to exit, they found a statistically significant relationship in the predicted direction.

Although this finding is highly suggestive, Orbell & Dawes' theory of "cooperator's advantage" cannot explain the tendency to project one's intentions onto others, as the authors are careful to acknowledge. Imagine a population of "doves" (who always cooperate) and "hawks" (who always defect). The problem is that any population mix that gives blindly trusting doves a "cooperator's advantage" must also give an even larger "predator's advantage" to optimistic hawks.

To elaborate, suppose the population initially consists only of hawks. Paranoia therefore thrives, and with good reason. Exits mean that this all-hawk population can be invaded by mutant doves who never play (since both hawks and doves receive the same exit payoff). Evolutionary drift then allows the doves to slowly spread. With no one to prey on, hawks cannot discover optimism, only doves can. Eventually, at least two doves begin to interact and dovish optimism briefly flourishes. But this in turn allows an optimist to mutate hawkishness or a hawk to mutate optimism. Once even a single hawk begins to play, optimism is doomed. First the dove optimists die off (since doves cannot survive invasion by a single hawk), and then hawk optimists die off (since hawks with only each other as partners are better off not playing). The population returns to all-exit and remains there, drifting towards a mix of paranoid hawks and doves, and waiting for doves to reinvent optimism. In short, the "cooperator's advantage" requires additional assumptions about exogenous selection pressures that protect doves against the evolution of optimistic hawks.

One of these pressures may be what Orbell & Dawes call "translucence." Translucence refers to the ability to spot telltale signs, such as involuntary emotional or physical expressions, that reveal the intentions of a prospective exchange partner (Frank 1993). While projection makes honest actors more likely to accept an offer of exchange, translucence makes offers by honest actors more likely to be accepted. If the game has exits, and if the costs of scrutiny and exiting are not too great, trustworthy contestants with a keen eye will enjoy improved prospects for interacting with others like themselves. Frank then shows how this generates an evolutionary footrace between the ability to fake trustworthiness and the ability to see through fakery.

Cultural Evolution and Kin Altruism

These evolutionary arguments show how cooperative strategies might become part of our instinctual programming. However, it is not clear whether cultural adaptation would also select these rules. Evolutionary game theory demonstrates the relative fitness of competing decision rules, but leaves to our imagination how successful rules might spread throughout the culture. Allison (1992), on the other hand, explicitly modeled the replication of successful rules as a process of cultural evolution. He developed a cultural analog of kin altruism based on the socio-biological principle of inclusive fitness. A parent who sacrifices for its young promotes the replication of its genes (including the gene for nurturing) more effectively than does a parent that abandons or eats its young. Allison hypothesized a similar process in cultural evolution. An altruist who sacrifices for the welfare of a close cultural relative compromises the ability to influence imitators but increases the influence of those that are helped. If the beneficiaries are also carriers of the kin altruism rule, and if their cumulative welfare is enhanced more than their benefactor's welfare is reduced, then there will be a net gain in the probability that the rule will be imitated. The sociological equivalent of kin altruism thus consists of rules to be kind to your close cultural relatives. Allison then suggests possible proxies for cultural relatedness, such as geographical proximity or a shared cultural marker. The use of markers for cultural relatedness might then explain why solidarity is often associated with a shared identity.

Allison advances evolutionary modeling by explicitly specifying how fitness translates into the replication of cultural rather than instinctual rules. Nevertheless, his model remains too close to its genetic forebear. Cultural analogs of genetic replication can be deceptive. What works for genes cannot be assumed to work for cultural norms. In biological evolution, children's instinctual traits are fixed at birth and are thus protected from later contamination by unrelated predators. Cultural evolution, however, does not have the necessary safeguard. If, as Allison suggests, the replication of cultural rules is based on the principle of imitation of the fittest, then there is nothing to prevent the highly fit beneficiaries of culturally related altruists from rejecting "parental" influence and instead modeling adults who eat their young.

In sum, while evolutionary game theory has made important advances in the ability to predict successful strategies, little is known about how fitness translates into the replication of cultural rules like reciprocity or altruistic norms. Analogs of genetic replication can be deceptive since social learning and sexual reproduction operate with very different logics.

Learning and Imitation as Evolutionary Mechanisms

Cultural adaptation need not be limited to socio-biological analogs. Learning theory suggests an alternative evolutionary process, based on the "law of effect" (Herrstein 1970). "If a rule or routine brings about a satisfactory result, continue to follow it; otherwise, try a different rule." The principle can be elaborated to include role modeling or social learning (Bandura 1977), in which actors imitate rules observed in significant (though not necessarily the "fittest") others.

The adaptive process becomes complicated in interesting ways when actors generate the positive and negative stimuli that condition their own and others' stimulus-generating behavior. The rich possibilities of this interactionist approach led Macy (1993a) to use a Bush-Mosteller stochastic learning model to study the evolution of cooperative behavior in social dilemmas. He showed how reward-seeking, penalty-aversive actors can lead one another away from mutually rewarding outcomes and into social traps in which everyone suffers. The punitive equilibrium is like a hole with a slippery and progressively steeper wall that traps any group that wanders in too far. Escape is possible, but it requires a coordinated response. Otherwise, volunteers find themselves trapped in a "crab's dilemma," in which the desperate crabs at the bottom of the bucket grab the legs of those trying to climb out and pull them back down.

Macy then showed how imitation can promote collective action. Coordination is much easier if actors look around to see what others are doing before deciding to participate. Computer simulations demonstrate that these two elementary and universal processes, reinforcement and imitation, can generate widespread cooperation even in severe social dilemmas (when the temptation of betrayal and the fear of being suckered are highly compelling). This in turn suggests that researchers may have been asking the wrong question. The problem is not why egoists cooperate but why they do not.

The simulations then identify likely causes of collective action failures. At the micro level, accommodation to the social costs of mutually predatory behavior precludes the aversive responses needed to spring the trap.[3] At the macro level, "weak ties" are needed for coordinating processes to spread quickly between local clusters of interactants.

In another study, Macy (1993b) revisited the "second-order free-rider problem" posed by Heckathorn (1993) in his research on "hypocritical cooperation." Learning-theoretic computer simulations confirmed the central finding in both analytic and evolutionary approaches, that free-riding is not necessarily an endless regress. He then tested the ability of various sanctioning regimes to generate cooperation as well as resist stampedes that risk overcooperation and needless sacrifice. External moral sanctions produced too little cooperation, while internalized sanctions produced too much. The best performer induced self-sustaining cooperation and then turned itself off once enforcement was no longer needed. This self-regulating system showed how collective rationality can obtain behind the backs of the actors, without anyone intending it.

A key limitation in Macy's work is the assumption that the costs and benefits of collective action condition cooperative propensities without regard to the context in which choices to participate must be made. Simulation of higher-order learning, using artificial neural networks and genetic algorithms (Bainbridge et al 1993), represents a highly promising new direction for future work on social learning and cultural evolution.

CONCLUSION

Rational choice theory has advanced our understanding of the microfoundations of social interactions based on the exchange of material resources. The formal rigor of analytic models has appealed to theorists interested in using mathematics to test internal validity, and to researchers interested in using controlled laboratory experimentation to test external validity. However, applications to other types of exchange, and to exchanges limited by the structure of social ties, have pushed researchers to look beyond the expected utility models imported from microeconomics. Structural network analysis, behavioral psychology, and evolutionary biology have contributed to recent efforts to model interaction as the exchange of social cues within networks that evolve alongside the choices they constrain.

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[3] Prospect theory (Tversky & Kahneman 1990) and comparison theory (Jasso 1993) suggest how expectations might be lowered in response to previous outcomes or outcomes observed among others.

These efforts to move beyond rationality in theories of choice pose two opposing risks. On the one side, models based on the exchange of social cues can easily lead to highly arbitrary behavioral assumptions that make the theories unfalsifiable or tautological. On the other side, efforts to restrict the latitude for action inherited from microeconomics can eclipse human agency and return us to conventional macrosociology in which actors are but the incumbents of social positions.

Fortunately, recent contributions have avoided these problems by strictly adhering to conservative theory-building strategies (Markovsky 1994), introducing complications, and incorporating results from other lines of inquiry, only as simpler, more parochial specifications are well-understood. We remain hopeful that these new developments will make formal theories of human agency more useful and compelling to scholars interested in noneconomic exchange.

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Literature Cited

Allison PD. 1992. The cultural evolution of beneficent norms. *Soc. Forc.* 71(2): 279–301

Axelrod R. 1984. *The Evolution of Cooperation*. New York:Basic. 241 pp.

Bainbridge WS, Brent EE, Carley KM, Heise DR, Macy MW, et al. 1994. Artificial social intelligence. *Annu. Rev. Sociol.* 20: 407–36

Bandura A. 1977. *Social Learning Theory*. Englewood Cliffs, NJ: Prentice Hall. 247 pp.

Becker G. 1991. *A Treatise on the Family*. Cambridge, MA: Harvard Univ. Press. 424 pp.

Bell D, Raifa H, Tversky A. 1988. *Decision Making: Descriptive, Normative, and Prescriptive Interactions*. Cambridge:Cambridge Univ. Press. 623 pp.

Bendor J. 1987. In good times and bad: reciprocity in an uncertain world. *Am. J. Polit. Sci.* 31:531–58

Bienenstock EJ, Bonacich P. 1993. Game theory models for exchange networks: experimental results. *Sociol. Perspect.* 36(2): 117–35

Bienenstock EJ, Bonacich P. 1992. The core as a solution to exclusionary networks. *Soc. Net.* 14:231–44

Blau PM. 1964. *Exchange and Power in Social Life*. New York: Wiley. 352 pp.

Coleman J. 1990. *Foundations of Social Theory*. Cambridge, MA: Harvard Univ. Press. 993 pp.

Cook KS, Withmeyer JM. 1992. Two approaches to social structure: exchange theory and network analysis. *Annu. Rev. Sociol.* 18: 109–27

Cook KS, Yamagishi T. 1992. Power in exchange networks: a power-dependence formulation. *Soc. Net.* 14:245–66

Duesenberry J. 1960. Comment on "An economic analysis of fertility." In *Demographic and Economic Change in Developed Countries*. Natl. Bur. Com. for Econ. Res. Princeton, NJ: Princeton Univ. Press

Ekeh PP. 1974. *Social Exchange Theory: The Two Traditions*. Cambridge, MA: Harvard Univ. Press. 237 pp.

Elster J. 1989. *The Cement of Society*. Cambridge: Cambridge Univ. Press. 311 pp.

Emerson RM. 1972a. Exchange theory. Part I: A psychological basis for social exchange. In *Sociological Theories in Progress*, ed. J Berger, M Zelditch, B Anderson, 1:38–57. Boston: Houghton Mifflin. 410 pp.

Emerson RM. 1972b. Exchange theory. Part II: Exchange relations and networks. In *Sociological Theories in Progress*, ed. J Berger, M Zelditch, B Anderson, 2:58–87. Boston: Houghton Mifflin. 410 pp.

Frank R. 1993. The strategic role of emotions: Reconciling over- and undersocialized accounts of behavior. *Rationality & Soc.* 5(2): 160–84

Friedkin N. 1992. An expected value model of social power: predictions for selected exchange networks. *Soc. Net.* 14:213–30

Friedman M. 1953. *Essays in Positive Economics*. Chicago: Univ. Chicago Press. 328 pp.

Gould RV. 1993. Collective action and network structure. *Am. Sociol. Rev.* 58:182–96

Granovetter M. 1973. The strength of weak ties. *Am. J. Sociol.* 78:1360–80

Hechter M. 1987. *Principles of Group Solidarity*. Berkeley: Univ. Calif. Press. 219 pp.

Heckathorn D. 1993. Collective action and group heterogeneity: voluntary provision vs. selective incentives. *Am. Sociol. Rev.* 58: 329–50

Herrnstein R. 1970. On the law of effect. *J. Exp. Anal. Behav.* 17:243–66

Homans GC. 1961. *Social Behavior: Its Elementary Forms*. New York: Harcourt Brace & World. 404 pp.

Jasso G. 1993. Choice and emotion in comparison theory. *Rat. Soc.* 5(2):231–74

Kahan JP, Rapoport A. 1984. *Theories of Coalition Formation*. Hillsdale, NJ: Erlbaum. 366 pp.

Kollock P. 1993. An eye for an eye leaves everyone blind: cooperation and accounting systems. *Am. Sociol. Rev.* 58:768–86

Kollock P. 1994. The emergence of exchange structures: an experimental study of uncertainty, commitment, and trust. *Am J. Sociol.* 100:313–45

Leik RK. 1992. New directions for network exchange theory: strategic manipulation of network linkages. *Soc. Net.* 14:309–23

Liebrand WBG, Messick DM, Wilke HAM. 1992. *Social Dilemmas Theoretical Issues and Research Findings*. Oxford: Pergamon. 334 pp.

Macy MW. 1991. Chains of cooperation: threshold effects in collective action. *Am. Sociol. Rev.* 56:730–47

Macy MW. 1993a. Social learning and the structure of collective action. In *Advances in Group Processes*, ed. E. Lawler et al, 10:1–36. Greenwich, CT: JAI. 304 pp.

Macy MW. 1993b. Backward looking social control. *Am. Sociol. Rev.* 58:819–36

Markovsky B. 1994. The structure of theories. In *Group Processes: Sociological Analyses*, ed. M Foschi, E Lawler, pp. 3–24. Chicago: Nelson-Hall. 262 pp.

Markovsky B, Skvoretz J, Willer D, Lovaglia M, Erger J. 1993 The seeds of network power: an extension of network exchange theory. *Am. Sociol. Rev.* 58:197–209

Marsden P. 1983. Restricted access in networks and models of power. *Am J. Sociol.* 88:686–717

Marwell G, Oliver P, Prahl R. 1988. Social networks and collective action: a theory of the critical mass. III. *Am. J. Sociol.* 94:502–34

Marwell G, Oliver P. 1993. *The Critical Mass in Collective Action: A Micro-Social Theory*. Cambridge, England: Cambridge Univ. Press. 206 pp.

Oliver P. 1980. Rewards and punishments as selective incentives for collective action: theoretical investigations. *Am. J. Sociol.* 85:1356–75

Olson M. 1965. *The Logic of Collective Action*. Cambridge, MA: Harvard Univ. Press. 186 pp.

Orbell JM, Dawes RM. 1991. A "cognitive miser" theory of cooperators' advantage. *Am. Polit. Sci. Rev.* 85(2):515–28

Orbell JM, Dawes RM. 1993. Social welfare, cooperators' advantage, and the option of not playing the game. *Am. Sociol. Rev.* 58:787–800

Rapoport A. 1970. *N-Person Game Theory: Concepts and Applications*. Ann Arbor: Univ. Mich. Press. 331 pp.

Schuessler R. 1989. Exit threats and cooperation under anonymity. *J. Conflict Resolution* 33:728–49.

Skvoretz J, Willer D. 1993. Exclusion and power: a test of four theories of power in exchange networks. *Am. Sociol. Rev.* 58: 801–18

Smelser NJ. 1992. The rational choice perspective: a theoretical assesment. *Rat. Soc.* 4(4): 381–410

Tversky A. Kahneman D. 1990. Prospect theory: an analysis of decision under risk. In *Rationality in Action*, ed. P Moser, pp. 140–70. Cambridge: Cambridge Univ. Press. 493 pp.

Vanberg VJ, Congleton RD. 1992. Rationality, morality, and exit. *Am. Polit. Sci. Rev.* 86: 418–31

White HC, Boorman SA, Breiger RL. 1976. Social structure from multiple networks. I: Blockmodels of roles and positions. *Am. J. Sociol.* 81:730–79

Winter S. 1986. Comments on Arrow and on Lucas. In *Rational Choice: The Contrast Between Economics and Psychology*, ed. R Hogarth, M Reder, pp. 243–50. Chicago: Univ. Chicago Press. 332 pp.

Yamagishi T, Cook KS. 1993. Generalized exchange and social dilemmas *Soc. Psychol. Q.* 56(4):235–48

Zeggelink E. 1993. *Strangers Into Friends.* Amsterdam: Thesis Publ. 201 pp.

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SEQUENCE ANALYSIS: New Methods for Old Ideas

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ABSTRACT

A wide variety of work in social science concerns sequences of events or phenomena. This essay reviews concepts of sequence and methods for analyzing sequences. After a brief definitional discussion, I consider sequence literatures from various areas. I then discuss recent methodologies for sequence analysis. I review stepwise approaches like Markovian and event history analysis as well as whole sequence approaches resting on new developments in biology and other fields.

INTRODUCTION

A quiet revolution is underway in social science. We are turning from units to context, from attributes to connections, from causes to events. The change has many antecedents: the exhaustion of our old paradigm, our inherent desire for change, the new powers of computers. It also has many consequences: new areas for empirical work, new methodologies, rediscovery of important old theories.

This essay concerns the temporal facet of this move toward context, a turn toward process and events that has taken shape in something called *sequence analysis*. It should be understood that sequence analysis (SA) is not a particular technique, like event history analysis. It is rather a body of questions about social processes and a collection of techniques available to answer them.

I begin with a review of the turn toward context, locating SA within a broader classification of approaches to social life. I then consider a variety of empirical literatures that raise problems appropriate for SA. This section leads

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into a discussion of the basic questions addressable within SA and a location of these questions within a grid of methodologies applicable to sequence data. I then consider some methods for sequence analysis.

Many apparently disparate developments in current sociology are avatars of one phenomenon: an emphasis on context. By context, I mean here simply the phenomena surrounding a case. I do not invoke the connotations of reflexivity that have become customary in the postmodernist usage of "context." I mean simply that sociologists seem less willing than heretofore to detach cases from the network of other cases and prior times.

For many years, our usual approach in sociology has been to think about cases independent of one another and, often, of the past. We characterize cases by properties like gender, race, totalitarianism, or bureaucratization and then ask how these properties are connected together in something we call a causal chain. Our methods are founded almost exclusively on such a model of social reality. And they have produced much interesting knowledge.

On the other hand, this model has major problems. It doesn't do very well by its own standards: Variance explained is often small, and effects are often substantively minimal despite their statistical significance. Rather than cumulation, we see diminishing returns. Moreover, the model's assumptions are embarrassing at best (as was recognized by some of its founders, see Blau & Duncan 1967). We assume intercase independence even while our theorists focus on interaction. We talk about causality while our theorists emphasize social action. Our articles are filled with statements about race and bureaucratization "doing things," even while our theories concern people doing things. Between the two lie a cumbersome set of just-so stories specifying that if the people typically do such and such to each other, then the variables will be related as so and so (Abbott 1992b).

Meanwhile, there are areas of sociological research that clearly center on problems of events and actions in their temporal context, what we might call sequence problems. The various literatures related to the life course are probably the largest such area, but the tangle of literatures related to careers—occupational, criminal, organizational—runs a close second. Here the central problem has been reconciling the theoretical "sequentiality" of these literatures with the unrelentingly nonsequential character of sociologists' preferred methodologies.

Beyond sociology, surprisingly, the issue of sequence and temporality is much less of a problem. Sequences of events have a long research history in psychology and have enjoyed a recent renaissance in economics. Linguistics also has a tradition of sequence research, as does archaeology.

Before considering the sequence literature, I give some basic concepts to set the stage. By *sequence* I mean an ordered list of elements. In the present paper the sequence will always be temporal, but mathematically the underlying property is order in one dimension, so spatial sequences (e.g. the arrangement of ethnic groups along transportation lines) would also fall under the term. However, there is no assumption of real time, as opposed to symbolic time, so *sequence* includes things like the order of steps in a manufacturing process or the successive parts of a ritual, where the time involved is artificial in some sense. Although the order of a sequence sometimes permits ties, as with parallel processes in a manufacturing process, most often we think of sequences as discrete, single lists, as in job careers. (To be sure, as moonlighting implies, even in careers we may not have a strong order, but rather simultaneous states.) The elements of a sequence are *events,* drawn from a set of all possible events in a set of sequences, the *universe* of events. We can conceptualize ties, in fact, as conjunctural events drawn from the power set of the current universe (which includes all combinations of basic events), so there is no real reason to worry about the idea of a single unilinear order.

A number of properties of sequences will be useful in the following discussion. First, events in a sequence can be unique or they can repeat. A sequence in which events cannot repeat, one that samples the universe without replacement, is *nonrecurrent.* The length of such a sequence cannot exceed the size of the universe; it will not equal that size if certain events do not happen. A sequence in which events can repeat—that is, a sequence that samples the universe of events with replacement—is a *recurrent sequence.* The length of a recurrent sequence has no limit but is typically set by some sampling frame—a lifetime, a wave of data collection, or something similar.

Second, sequences can have dependence between their states. The most familiar examples of this are stochastic processes, in which the $n + 1$th element of the sequence is some specified function of the nth or perhaps earlier elements. With a finite universe and a scalar probability of any given $n + 1$th state after any given nth state, we have the simplest such case, the Markov process. There are of course many more complicated arrangements, particularly when the universe is infinite or continuous, as with interval-valued variables. There we may find higher-order autoregressive schemes, moving averages schemes, schemes introducing error, and so on. By contrast, there may on the other hand be minimal inter-state dependence, as in the example of the order of prayers in the Roman, Milanese, Syriac and other rites of the various Catholic churches.

Third, there can be varying degrees of dependence between various whole sequences. As Harrison White noted in *Chains of Opportunity* (1970), we sometimes have sequences in which the occurrence of an event in any one sequence prevents that occurrence in any other; there can be only one Editor of the *American Journal of Sociology* at once, for example. This is true in a looser form for phenomena like "upper-classness" or "working in the farm sector" where larger constraints, usually conceptualized in sociology as "constraints on the marginals," limit possibilities across sequences.

Fourth, sequence can be investigated either for itself or as an independent or dependent variable. Sometimes we are interested simply in the patterns in a collection of sequences. Other times we wish to know how the prior event sequence affects the immediate future, as when we try to predict joblessness given prior *sequence* of job experiences. Still other times we wish to know what accounts for different sequences of behavior—what prior variables, for example, lead to descending spirals into criminality?

These four properties form a useful framework for analysis. In looking across the various sequence literatures, we shall see that some involve recurrent, others nonrecurrent sequences. Some look for dependence within sequences, some between. Some consider sequence for itself, others for its origins, still others for its causal power.

LITERATURES

I have focused my prior reviews of sequence literatures (1983, 1990) on sociology alone. But readers have been befuddled by seeing familiar things like careers and school-to-work transitions through the unfamiliar lenses of sequence analysis. I therefore base my review on diverse sequence literatures around the social sciences, turning to sociology proper only at the end. In all areas, the review is selective, not exhaustive.

Psychology

The largest literature on sequences in social science is in psychology. This work is in three areas: cognition (broadly understood), interaction sequences, and theories of developmental stages.

The first major cognitive sequence topic is perception. Typically, sequences here are sequences of stimuli, treated as independent variables that affect level of perception or discrimination. Thus Polich (1987) studies EEG responses to tone sequences, Baird et al (1991) study verbal judgments of loudness in tone sequences, and Allik (1992) studies judgments of motion given random dot patterns with varying luminance. Occasionally this literature studies internal dependence, but only as an independent variable: French-St. George & Bregman (1989), for example, study the impact of predictability of tone sequences on ability to discriminate tones. This has been an area of considerable theoretical development, aimed at the general problem of how subjects distinguish "parameter" change from "noise" change in sequential perceptual stimuli. Treisman & Williams (1984) advanced the theory of criterion-setting for this problem, while van Leeuwen et al (1988) explain sequence influences by a more general formal theory of perception.

Another sequence literature in studies of individual cognition concerns more general topics, particularly memory and learning. Here, too, sequence is sometimes an independent variable only. Thus, Park & Tennyson (1986) examine tailoring the sequence of assistance in a computer-based learning system to patterns of student error, and Wold & Reinvang (1990) examine effects of sequence of information on the ability to recall it. Some studies focus on the effect of sequence on judgment. Thus Mullen et al (1989) and Davis et al (1989) investigate effects of polling sequences on estimates of consensus in groups, and Peake & Cervone (1989) investigate *sequence anchoring*, an extended form of primacy effect in which early judgments influence later ones. All of this work on judgment falls within the study of internal sequence dependence.

Most of the cognitive psychology literature on sequence, however, concerns sequence as itself an object of learning or perception, often integrating that with a concern for the actual sequence of learning. For reasons that become clear on reflection, sequences of learning are best investigated empirically by studying the learning of sequences. In a typical study, Winn (1988) investigates whether students can remember the order in which concepts were presented. Sometimes studies concern the relation of sequence perception to sequence production or discrimination (Terrace 1986, Grenzebach & McDonald 1992), but the more characteristic study tries to embed learning of sequences in a more general theory of learning or encoding of information (Cohen et al 1990). Another interesting literature concerns the ability to reconstruct full sequences out of partial information (Oppenheimer & Lee 1983, Oppenheimer & Groot 1985, Wyer et al 1985), a topic that has also emerged in the "script" literature spawned by the work of Schank & Abelson (1977; e.g. Hue & Erickson 1991). Read et al (1989) show nicely how reordering can radically change subjects' understanding of the meaning of particular events.

A final cognitive literature concerns sequences of action. Here again, sequence is typically an independent variable, usually in the form of sequences of reinforcement (success of some sort). A substantial literature studies the effects of the "illusion of control," artificially high reinforcement early in a given experience (Burger 1986, Fleming & Darley 1990), but there is also a longstanding and enormous literature on schedules of reinforcement (e.g. Pittenger et al 1988). There are a few studies of mechanisms for generating sequences of action (e.g. Garcia-Colera & Semjen 1987 on finger movements and Inhoff 1986 on eye movements).

Studies of individual sequences in psychology are supplemented by a second major literature, that on interaction. Once prominent in social psychology generally (e.g. in the Bales tradition), interaction sequences are now more common as topics in the therapy literature. Parker (1988) exemplifies the long-running literature on turn-taking in conversation. On a broader scale, Staw

& Ross (1989) consider escalation situations, changing the reinforcement schedule of the classical experimental paradigm into a mutual reinforcement system and examining the origins of such systems. Also common are studies of "sequence of sequences," that is, studies of the development over time of sequential interaction patterns. Mays (1986) examines this in small groups, while Ryle (1991) provides a Vygotskian theoretical analysis of counseling sequences. Ney (1987) gives a typical analysis of "the natural sequence of events" in counseling, in this case for treatment of child abuse. Mishler (e.g. 1986) has done much work on narrative sequences in counseling. Bakeman (e.g. Bakeman & Gottman 1986) has done a variety of interaction sequence studies.

Another interactional literature focuses on sequences of family interaction generally and mother-child interaction in particular. Cohn & Tronick (1987) examine developmental patterns in mother-child interaction, while Lamb & Malkin (1986) study such patterns when the child is seeking aid. Duncan & Farley (1990) consider the emergence of conventions in parent-child sequential interactions. Vucinich (1984) has looked more broadly at sequences in family conflict.

The final psychological sequence literature concerns developmental sequences. Such conceptions—known and despised in sociology as stage theories—are widespread in psychology. A good but dated review essay is Campbell & Richie (1983), which urges continuing use of developmental sequences despite arguments against them. Campbell & Richie were clearly preaching to the converted; the developmental literature continues to make sequence one of its fundamental concepts. Lister et al (1990) consider concept development in children, and Berti et al (1986) focus on acquisition of economic ideas, on which there exists a substantial literature. Another literature continues the longstanding research on moral development sequences (Vasudev & Hummel 1987, Foster & Sprinthall 1992). A final literature discusses sequences of diseases and treatments. For example, Faedda et al (1991) consider response to lithium, Deltito et al (1991) consider symptom change in panic disorder, and Ellickson et al (1992) study sequential patterns of drug use.

Overall, then, there is much writing on sequence in psychology. In most of it, however, the conceptualization of sequence is simple. Particularly when sequence is an independent variable, sequence is defined as simple reversal, or as monotonic ascent or descent, or some similarly regular pattern like alternation. Complex sequence patterns are never investigated except as tasks for tests of cognitive functioning or as linear sequences of nonrecurring states in developmental sequences. Even within the psychological literature on interaction, there is seldom a focus on serious contingency in sequence. When there is, it is usually seen in a stochastic process (usually Markovian) framework.

Economics

Economics, like psychology, features several disparate literatures on sequences. There is a longstanding literature on sequence problems in operations research proper that ties loosely to studies of sequential games. The games literature ties further to some papers on sequence problems in general economic theory. There is also a specific literature on sequences in markets. Finally, there is some writing on sequence effects in advertising and consumption, loosely related to the literature in psychology on sequence effects in perception.

The operations research literature is highly technical. Most of it concerns scheduling problems where there are one or more machines capable of performing several tasks, and the costs of setting up machines for new tasks are a function of the sequence in which the tasks are done. [A favorite example: making chocolate cake mix after white cake mix requires less set up than making white cake mix after chocolate! (Meier et al 1982 cited in Dilts & Ramsing 1989)] Exemplary papers are Chand & Chhajed (1992), Dilts & Ramsing (1989), Dobson (1992), and Gupta & Darrow (1986). Perhaps more interesting, for its practical utility, is Nakai's (1986) paper on another common problem, how to make a best selection of candidates interviewed sequentially, once known as "the classical secretary problem" (Nakai 1986:478). Although these papers seem technical, they concern problems central to daily social life and addressed by a variety of satisficing strategies. They provide important models for thinking about social processes. Because of its genesis in immediate application, operations research work on sequence and scheduling often makes a lot more practical sense than do the more arcane flights of game theory.

In general economic theory, sequence concepts are uncommon, since the characteristic move of that area is to seek asymptotic distribution theory precisely in order to ignore the sequence of intermediate states. Nonetheless, sequential equilibrium (Kreps & Wilson 1982) is an important topic in game theoretic economic writing (e.g. Besanko & Spulber 1990). In sequential equilibria, game players' strategies respond to each others' given beliefs about the rest of the game and to information sets governing their knowledge of other players' behaviors. The central empirical questions involve the game's coming to rest in one or more equilibrium points. Hoel (1987) relaxes the customary game theoretic assumption of an exact alternating sequence of offers, allowing "plays" at random times by random players. Economists, like psychologists, have often used Markovian approaches to sequences, as in Hopp's (1987) study of investment decisions.

A related literature considers sequences within specific market contexts. Here, as in the psychological literature, sequence may be either central (as in studies of interaction) or simply used as an independent variable. The most common issue is reaction to certain kinds of sequence signals, as in psychology's sequence perception problem. Thus, Burgstahler & Noreen (1986) consider reactions of securities markets to sequences of related events (an independent variable model), while Vickers (1986) and later Delbono (1989) study markets where there is a sequence of innovations (that is, a sequence of opportunities to arbitrarily lower one's production costs over the next competition interval). In these two studies, the focus is on sequential decision-making. In both cases, the derived theory shows that crucial characteristics of the products, produced markets, or bidding games shape the unfolding of the observed sequence of dominance. A similar theme appears in other kinds of studies, as in Dewatripont's (1987) study of sequential models of spatial competition. Sequential game theory is related to other kinds of sequential social theories, like Fararo & Skvoretz's production theory (Fararo & Skvoretz 1984, Skvoretz & Fararo 1989). These are the coming formalizations of social action and will replace the simple exchange theories of the Homans/Blau era. [Their equivalent in the area of cognition is the Schank/Abelson (1977) script tradition.]

Also to be considered under economics are stray articles in marketing that employ sequential ideas. Sequence effects for advertisements are tested by Aaker et al (1986) and Marks & Kamins (1988). Others (Stoltman et al 1990) have tested different orders in consumption decisions—does one first choose brand, store, store type, or location? I note these papers less to draw on their scientific content than to show that interest in decision sequences extends beyond the pure psychology and economics community well into applied contexts.

Archaeology

Archaeology has long been interested in sequence analysis. The problem of ordering sequences of artifacts, using measurements provided either by resemblances between artifacts or by proximity in sites, provided the first impetus to many current methods in sequence analysis. Hodson et al's monumental collection (1971) brings many of these works together in one place and provides an entry to the field. This literature continues to grow.

Although the theoretical question is nearly always the simple stage problem of what came before what, a variety of sequence methods are used in archaeology, some reflecting modal characteristics of artifacts, some reflecting more complicated statistical analysis. For an example employing several techniques, see Tolstoy & DeBoer (1989). Typically, profiles of sites in terms of different kinds of artifacts are used to sequence sites or industry types, if that is desired (McBrearty 1988). Sometimes the methods used are extremely ingenious and rely on knowledge of complex sequential constraints, as in tree-ring dating of rooms in pueblos (Crown 1991—these are analogous, formally, to the scheduling problems of operations research). One worry in the archaeological literature is the pervasive assumption that there is a single directional sequence without cycles. Bird & Frankel (1991) raise this problem in connection with Holocene Australia, showing the difficulties of dovetailing sequences at individual sites with those elsewhere, particularly in the case of random censoring and research-induced sampling biases.

Linguistics

A variety of sequence questions have been investigated in linguistics. As in psychology, sequence is here most often a straightforward and usually simple independent variable. Generally, studies transpose words, grammatical structures, or whole parts of texts, and investigate the disturbance of comprehension. The wide range of such studies is indicated by Gisiner & Schusterman's (1992) paper, which concerns sequence effects in a language-trained sea lion. Another illustrative paper is Jonz's (1989) investigation of scrambled texts with native and non-native English speakers. A central question here—one that derives from the work of Piaget and that is central for our understanding of time more broadly—is exactly how people construct their images of and words for temporal processes and sequences. Much work concerns acquisition of such conceptions in children: Natsopoulos & Abadzi (1986) exemplify this literature. As that example suggests, the issue of linear development—the stage-theory question—is as important in linguistics as in psychology. In both cases we have sequences of sequences. Thus we find stage theory throughout language acquisition studies, not only for children, but increasingly for second language acquisition as well. Laufer (1990) studies stages in second language acquisition and illustrates a common theoretical move among stage theorists—insisting on absolutely regular gross succession, but allowing a fair amount of inversion and irregularity in the details of acquisition within stage.

Political Science

In political science, sequences have played important roles as well. The modernization tradition was anchored in a stage theory hypothesis, which spread from its application to economic change. (by scholars like Rostow), to applications to political development (in Huntington and his followers), to nationalism (in the work of Deutsch and others). More recently, stage theories have been applied to the welfare state, a problem analyzed in detail by Abbott & Deviney (1992). In some political science discussions sequence means, as it usually does in sociology, essentially a sequence of variables (e.g. Carmines & Stimson 1986). At other times, sequence is conceived essentially as some form of autoregression (Waterman et al 1991). Or again, sequence can be conceived as simple transposition in order (economic liberalization before or after political liberalization in Weintraub & Baer 1992). Auten et al (1984) present such a one-step model of budgeting. A far more sophisticated sequential model of budgeting appears in Padgett's classic 1981 article, which remains one of few really serious multilevel stochastic models of sequences of events.

The various nonsociological sequence literatures share a number of characteristics. First, the most common sequence approaches in them are two: 1. use of stage theories to comprehend patterns of development, and 2. analysis of the effects of fairly simple sequence effects (e.g. inversions) as independent variables. Stage theories with their assumption of nonrecurrence are widespread; they are central in developmental psychology, archaeology, and political science. Similarly, the limitation of sequence effects to simple reversal or, at most, variation among the order of three events is pretty universal across the psychological, political scientific, and linguistic literatures. Economics stands out for its formal approach to sequence issues, usually within a stochastic framework either in real time or in the "decision tree time" of game theory. The various Markovian studies scattered across linguistics, economics, and psychology also fit this one-step sequence format, focusing on internal interdependencies in sequences. No nonsociological work really addresses the contingencies between separable sequences, although one could think about the beliefs and strategies of participants in extensive games as separable but interdependent sequences.

Sociology

The two principal sociological literatures involving sequential conceptions have both been discussed in recent *Annual Reviews*. The life cycle literatures were reviewed by O'Rand & Krecker in 1990, and the careers literature by Rosenfeld in 1992. I have little to add to those reviews in terms of coverage of the literature.

Although sequences have made many appearances in sociology, there are few formal theoretical analyses for them. I have already noted the Fararo/Skvoretz tradition. There was also early work by Mayhew and others (Mayhew et al 1971, Mayhew & Levinger 1976), and by Abbott who (1983) attempted to characterize the theoretical and methodological literature on sequences. Beyond that, the theoretical work in sociology is minimal. By far the most important theoretical literatures for understanding sequences of social events per se are the analytical philosophy of history (reviewed in Gardiner 1959 and monumentalized in Danto 1985) and the structuralist theory of narrative (reviewed in Chatman 1978 and epitomized in the astonishingly brilliant Barthes 1974). These are large literatures, not to be summarized sketchily. Nor have they been transcended by the culturalist muddles about history that dominate debates on historiography and narrative today. An attempt to reconcile all these literatures is Ricoeur (1984–1985: definitely not for the intellectually faint at heart).

There are really three levels of sequence conceptions in sociological writing.

The simplest are linear stage theories. These are familiar not only in the life course literature, but also in the dozens of "-ization" literatures—professionalization, rationalization, modernization, and so on. In sociology, formal stage theories have long been common. One finds them in Marx, Michels, Bateson, Kuhn, Smelser, and many others. A particularly rich source are the "natural histories" of the Chicago School, whose leader Robert Park saw stage theories nearly everywhere: in revolutions (Edwards 1927), gangs (Thrasher 1927), commercial organizations (Hughes 1928), criminal careers (Shaw 1930), dancers' careers (Cressey 1932), and so on. Other versions of stage theories are theories about "short sequences" that must be negotiated in some order, typically the school-to-work transition, but often something more quirky like the transition to criminality (Sampson & Laub 1993). These are "turning points" theories.

The next level of sequence conception involves much more contingency and accident than do stage theories. Sequences here are often more subject to influence by other sequences or by marginal conditions. Most of the job careers literature takes this approach, probably because even at the simplest level—employment and unemployment—job histories are astonishingly erratic. I therefore call these "career" theories, bearing in mind that many theories about people's careers are actually stage theories, expecting regular development, usually of nonrecurrent events.

The most extreme form of sequence conception makes all sequences interdependent in a complex network. I have elsewhere (1992c) called such theories *interactional field theories*. They are quite common. White's (1970) vacancy chain model is of this kind, but so also was Abbott's theory of professions (1988a). Such theories require quite unusual methodological handling; White resorted to modeling sequences of holes in the system rather than sequences of jobs held by individuals (see Chase 1991 for a review of such models).

The sociological literature thus involves some of the same issues as do other literatures, but it has different emphases. Stage theories dominate in the life-course literature and in much of the "transitions" literature that is a part of it. But by contrast career theories dominate most job research, and the despair of discovering patterned sequences has forced that literature to focus on point outcomes or one-step stochastic models.

METHODS

Researchers with sequence data sets and sequence-related questions can follow a fairly clear decision tree in their search for methods. The first decision is whether to analyze actual data or to construct data based on parameters from actual data, that is, to simulate. The latter is the choice of game theory and its relatives, and I do not treat it extensively, as Oliver (1993) has reviewed a related topic recently and Macy discusses such issues elsewhere in this volume. The central problem with simulation is the semantic one of justifying the application of a particular simulation to a particular body of data. Unfortunately, it is usually true that many simulations can be constructed to "fit" a body of data, given sufficient assumptions about parameters. The justification of any particular model is therefore often very weak. In general, simulation buys syntactic power—internal logical consistency and, often, a wonderfully counterintuitive unpredictability—at the price of this semantic obscurity. It is worth noting, however, that mathematical models of this type have a considerable history in sociology (e.g. Granovetter 1978), following on Rashevsky's curious work in the 1960s (Rashevsky 1968).

If one is not using simulation-based methods, the next decision, as I have made clear elsewhere (1992a), is whether one wishes to treat the sequence as a whole or step by step.

Step-by-Step Methods

The step-by-step choice leads to time series, Markovian, and event history methods. If the central interest is a fairly deep and complex dependence of an interval-measured sequence upon its own past, then one applies time series methods. These aim to find a simple stochastic generator that effectively fits an entire sequence. It may involve autoregression, moving averages, or both in combination, and may reach varying depths into the past. The basic idea of time series analysis is to write a model that is presumably causal; mechanisms must be postulated that dictate the particular model structure—lag, averaging, and so on. New developments include introduction of event-type disturbances in time series, on which see Isaac et al 1991. The definitive text is Box et al 1994.

When the variable of interest is categorical, the step-by-step analyst employs traditional Markov methods, aiming to fit sequences of categories by estimating transition probabilities step by step and perhaps invoking either deeper past dependence (higher order) or changing probabilities (nonstationarity) to account for misfit of a one-step model. Despite early widespread application in mobility studies, Markovian analysis has not flourished in sociology, probably because it delivers powerful predictions only in the case of stationary processes (which are rare) and is practical only when the models involve just one previous time period and a fairly small state space. Useful reviews of this early but lapsed literature are Boudon (1973) and Stewman (1976), although Markov models are still occasionally used (see Brent & Sykes 1979 and Manderscheid et al 1982).

Where one is interested in transitions from only one particular prior category, and the issue is time until transition (e.g. how long is it before married people get divorced), one has event history methods, known outside sociology as duration methods, hazard methods, failure analysis, and various other names. These have begun to see very widespread application in sociology, as any perusal of the *American Sociology Review* or the *American Journal of Sociology* shows. Although I personally have reservations about these methods (Abbott 1983, 1992), they are widely used and must be understood by any serious sequence analyst. A current review is Yamaguchi (1991).

Whole Sequence Methods

If on the other hand one wishes to treat sequences as whole units, then one must have recourse to special methodologies. However, it is useful, first, to note the basic questions of interest here. The central issue in whole sequence analysis is nearly always whether there are patterns among the sequences, either over the whole sequences or within parts of them. One may wish to ask where these patterns come from (making them dependent variables), or what they mean for the future (making them independent variables), but the first problem is always to figure out whether the patterns are there.

There are two broad approaches to this question of pattern. One is algebraic, the other metric. In the algebraic approach, the aim is to reduce each sequence to some simplest form and then to gather all sequences with similar "simplest forms" under one heading. In the metric approach, the analyst develops a measure of resemblance that gives the "distance" between any pair of sequences. These distances are then subjected to some standard classification method like scaling or clustering (on which see Arabie & Hubert 1992 for a recent review).

Many people are seeking ways to code whole sequence data. Often, the coding seems obvious, as in coding careers as simple lists of jobs; a career is simply the year-by-year or month-by-month list of jobs held. But when matters are more complex—as in attempts to code interaction or stories or parallel sequence tracks—the varieties of schemes are endless and could be the subject of their own review. There is a large literature in discourse analysis and related literatures on detailed formal representations of discourse and discourse-like processes. Poole (e.g. 1989) has done much work developing multilevel coding schemes for interaction, and indeed the Balesian interaction process analysis tradition continues (Kosaka 1993, responding to Abell 1993). See also the extensive work of Bakeman & Gottman (1986). Trabasso (Trabasso & Nickels 1992) has developed a "causal network discourse analysis." Another new scheme has emerged in the sociology of science (Latour et al 1992, Scott 1992, Carlson & Gorman 1992), although it seems to this writer that the Latour et al project more or less reinvents network analysis. For yet another coding system (and software), see Carley (1991) and Carley & Palmquist (1992). Mishler (e.g. 1986, 1990) has done much work on interview coding and analysis. Franzosi (1990) and others have worked on the coding of stories from newspapers. Indeed, much of David Heise's ETHNO program is aimed to help investigators create a formally coded narrative structure for sequence data in interactive format.

What to do with the data once coded is another matter. In the one specific case of nonrecurrent sequences with complete data (each event observed once and only once in each sequence), there are a broad variety of permutational techniques available. These follow the metric approach above. They produce measures of resemblance between sequences, which the analyst may then scale or cluster in order to create categories that can in turn serve as dependent or independent variables. Spearman correlation is such a measure of resemblance. Where one has nonrecurrent sequences with missing data (through time frame censoring or simple nonoccurrence), the problem can be treated as a seriation or one-dimensional scaling problem, provided there are measures of distance or resemblance between sequence elements. (For an example, see Abbott 1991.) Arabie & Hubert (1992), however, warn of difficulties in such applications.

Once one moves to recurrent events, there are three explicit methodologies for considering sequence regularities of some complexity, all products of extensive theoretical and research programs. Two are algebraic in approach (David Heise and Peter Abell), and one is metric (Andrew Abbott). If the data involve branching and merging sequence lines, that is, if they involve separable but simultaneous events that the analyst does not wish to treat as combination events, the only possible choices at present are the methods of David Heise and Peter Abell. In the case of unilinear sequences, Abbott's methods are available and probably preferable. In reality, the three methods are aimed at different parts of the overall task of sequence analysis. Heise's methods are chiefly aimed at a rigorous and fully justified coding. (See his comments on Abell 1993.) Abell's methods are chiefly aimed at algebraic classification of already coded narratives. Abbott's methods are aimed at metric classification of coded narratives and, while much more flexible than Abell's, are presently available only for the case of unilinear sequences.

David Heise's ETHNO system arose out of his work coding extended action and interaction patterns, and looks to the theories of Fararo & Skvoretz (1984). It is embodied in an interactive software system (ETHNO: see Heise 1989, 1991) [available from WC Brown publishers in Dubuque, IA for $50]. For reviews, see Griffin (1993) and Barnes (1993). ETHNO presumes that the analyst has a data set composed of more or less extended narratives of particular stories that must be reduced to bare bones structures by creating a lexicon of actions and events and then formalizing the ways in which these actions and events proceed from one another. The formalization encodes the analyst's understanding of necessary relationships among the events to be placed in the narrative structure. ETHNO is well illustrated in Griffin's (1991) piece on lynching and Eder & Enke's (1991) equally challenging analysis of gossip. See also Heise's own applications, especially Corsaro & Heise (1990).

Far more than Abell and Abbott, Heise has focused on problems of semantic definition in sequence analysis. The end result is an exceptionally clear and empirically justified coding of the narrative, combined with the idea that generalization entails finding other narratives that "collapse" into the same primitive structure when the various narrative lines are simplified. (This is more or less the narrative homomorphism criterion of Abell, which Heise, in commenting on Abell 1993, argues is the best criterion for sequence resemblance.)

Abell's homomorphism approach to sequence resemblance grew out of his own research on cooperatives and his extensive critique of standard methodologies (Abell 1987). The best recent exposition is Abell 1993, which has the advantage of being followed by lengthy responses from Heise, Fararo, Skvoretz, Abbott, and other analysts of social sequence data. Like Heise's methods, Abell's are applicable to complex, network narratives. [They should ultimately be available (in late 1995) in the UCNET system of programs, but at present are available from Martin Everett in the Department of Mathematics, Greenwich (England) University.] Abell's methods presume, like Heise's, a data set comprising various narratives of various degrees of complexity, but they focus more on the formal graphical structure of these narratives. They contain routines for reducing any coded narrative to a minimal homomorphic representation, which effectively allows one to further classify a set of Heise codings once they are developed within ETHNO. Abell (1993) has done a detailed analysis of narrative data on consumer cooperatives.

Abbott's strategy for sequence analysis—optimal matching or optimal alignment as it is usually called—derives from a broad movement in the hard sciences, although it was stimulated by his work as a historical sociologist of occupations (Abbott 1988a) and his critique (similar to Abell's) of general linear models (Abbott 1983, 1988b). The methods Abbott has adapted derive from biology and from the pattern resemblance community in computer science. The classic text on these methods is Sankoff & Kruskal (1983). Recent primers are Heijne (1987) and Gribskov & Devereux (1992). Some recent developments are discussed in Abbott (1993).

The principal practical difference between Abbott's methods and Heise's or Abell's is that Abbott's are limited to unilinear sequences and proceed by metric means. They presume a data set made up of sequential lists of events, like job careers or criminal careers. Under more or less parametric assumptions about the resemblance of individual events (jobs or crimes), the methods allow one to find resemblances between either entire sequences or subsequences within them. As with other metric techniques of sequence analysis, these resemblances are then input to scaling, clustering, and other categorization methods to uncover actual categories of patterns. Abbott's techniques are available in simple form in his OPTIMIZE program [from him, $20], although any publicly available biological sequence alignment program will do the same things, after some modification of its IO facilities.

Optimal matching has begun to see substantial use in social science. Abbott's own published analyses include papers on dances (Abbott & Forrest 1986), on careers (Abbott & Hrycak 1990), and on welfare states (Abbott & Deviney 1992). He has tested reliability in Forrest & Abbott (1990). Jones & Brain (1985) utilize the event distance coding characteristics of optimal matching. Coxon (1988) reports both an elaborate coding scheme and application of matching methods to sexual behavior. (There may be more complete publications from this study that I have not been able to find.) Miller & Roid (1993) apply optimal alignment to movement patterns in infants, while Levitt & Nass (1989) nicely use optimal matching to demonstrate consistency among physics and sociology textbooks. Saberwahl & Robey (1993) apply the techniques to find regularities in innovation processes, as does Poole (1993). Chan (1994) has used optimal matching to analyze mobility paths, as has Carpenter (1994). Stovell (1994) uses the methods in an insightful analysis of county lynching patterns in the US South.

One of the advantages of optimal matching/alignment as a sequence technique is that analysts whose theories predict different forms of resemblance can vary the algorithms to suit them. Thus, stage theories with some local disorder—a common position among stage theorists—can be sought using variants of the cellar algorithm (Wagner 1983). Theories implying the unimportance of minor shifts in duration of runs can be handled with variants of the affine gap-cost algorithm (Sankoff & Kruskal 1983:296ff). "Subsequence problems" across large data sets (the "turning point question" in life cycle data) can be handled with new local alignment algorithms using Gibbs samplers and expectation maximization (Lawrence et al 1993). More important, the unilinearity constraint is slowly being lifted. Even game theoretic sequences (which branch at each decision point) will probably be analyzable using the tree resemblance algorithms of Shasha and others (Zhang & Shasha 1989, see also Sankoff & Kruskal 1983: 265ff).

At present the measure theory of whole sequence data is preliminary indeed. In the highly specialized but fairly common situation of sequences embodying stages that all cases traverse in the same order, the methods of Collins et al (1988: a kind of generalized Guttmann methodology) may prove to be generalizable from their original of use as a generator of scaling items. But much depends on formal models of sequence generation and, probably more importantly, on the actual methodology chosen. Abbott (1984) raises a number of general measurement issues. Another extraordinarily interesting area is scheduling theory; for example, Birch (1984) has an extremely interesting paper on sequences generated by simple activation time models. Scheduling models such as the Fararo/Skvoretz production scheme may prove crucial to developing serious measurement analysis for sequence data. Sequence-guessing programs created by artificial intelligence may also be important. For an example, see Dietterich & Michalski 1985.

In summary, sequence methods seem to be poised at a point of major development. Once the vast array of biological algorithms can be harnessed to a reasonable sociological IO system, Abbott's empiricist sequence resemblance techniques should become a reasonable tool. The major problem then will be to think through ways of combining Heise's elegance of description, Abell's rigor of homomorphic classification, and Abbott's empirically practical use of metric techniques. Unsolved even in computer science, however, is the combination of the last two (analysis of network-structured sequence data with metric resemblance techniques), although see Abbott (1993) for speculations on this matter. Unsolved too are the great difficulties of developing a serious measurement and statistical theory for sequence analysis. All these methods at present are largely heuristic. Only now are the biologists really facing the problems of statistical inference with sequences, problems that differ in many ways from the kinds of inferences sociologists may wish to draw. (For the biological literature, see Karlin et al 1991 and Vingron & Waterman 1994.)

Sequence analysis holds great promise for sociology. Most of our classic theories are sequential or interactional theories. The new methods address those theories directly. What the field needs now are junior scholars committed to exploring what sequence regularities can tell us about social life. The methods will not, to be sure, solve the great problems represented by interactional fields—where all sequences are mutually dependent and the data bewilderingly complex. But the methods will provide us with far more effective ways of analyzing life courses, careers, and other such relatively independent and regular sequences, ways of analyzing that accord directly with the canonical theoretical apparatus of the discipline.

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Literature Cited

Aaker DA, Stayman DM, Hagerty MR. 1986. Warmth in advertising. *J. Consum. Res.* 12:365–81

Abbott A. 1983. Sequences of social events. *Hist. Methods* 16:129–47

Abbott A. 1984. Event sequence and event duration. *Hist. Meth.* 17:192–204

Abbott A. 1988a. *The System of Professions.* Chicago: Univ. Chicago Press

Abbott A. 1988b. Transcending general linear reality. *Sociol. Theory* 6:169–86

Abbott A. 1990. Primer on sequence methods. *Organ. Sci.* 1:373–92

Abbott A. 1991. The order of professionalization. *Work Occup.* 18:355–84

Abbott A. 1992a. From causes to events. *Sociol. Methods Res.* 20.428–55

Abbott A. 1992b What do cases do? In *What*

Is a Case?, ed. CC Ragin, HS Becker, pp. 53–82. Cambridge: Cambridge Univ. Press. 242 pp.

Abbott A. 1992c. Of time and space. Sorokin Lecture, Southern Sociol. Soc., New Orleans. 10 April 1992

Abbott A. 1993. Measure for measure. *J. Mat. Sociol.* 18:203–14

Abbott A, Deviney S. 1992. The welfare state as transnational event. *Sociol. Sci. Hist.* 16: 245–74

Abbott A, Forrest J. 1986. Optimal matching methods for historical sequences. *J. Interdiscip. Hist.* 16:471–94

Abbott A, Hrycak AM. 1990. Measuring resemblance in sequence data. *Am. J. SOciol.* 96:144–85

Abell P. 1987 *The Syntax of Social Life*. Oxford: Oxford Univ. Press

Abell P. 1993. Some aspects of narrative method. *J. Mat. Sociol* 18:93–134

Allik J. 1992. Competing motion paths in sequence of random dot patterns. *Vision* 32: 157–65

Arabie P, Hubert LJ. 1992. Combinatorial data analysis. *Annu. Rev. Psychol.* 43:169–203

Auten G, Bozeman B, Cline R. 1984. A sequential model of congressional appropriations. *Am. J. Polit. Sci* 28:503–23

Baird JC, Berglund B, Berglund U, Lindberg S. 1991. Stimulus sequence and the exponent of the power function for loudness. *Perception Motor Skills* 73:3–17

Bakeman R, Gottman JM. 1986. *Observing Interaction*. Cambridge: Cambridge Univ. Press

Barnes JH. 1993. ETHNO. *Advan. Consumer Res.* 20:63–69

Barthes R. *S/Z*. 1974. New York: Hill & Wang

Berti AE, Bombi AS, de Beni R. 1986. The development of economic notions. *J. Econ. Psychol.* 7:415–24

Besanko D, Spulber DF. 1990. Are treble damages neutral? *Am Econ. Rev.* 80:870–87

Birch D. 1984. A model of fixed activation time scheduling. *J. Math. Psychol.* 28:121–59

Bird CFM, Frankel D. 1991. Problems in constructing a prehistoric regional sequence. *World Archeol.* 23:179–92

Blau PM, Duncan OD. 1967. *The American Occupational Structure*. New York: Free

Boudon R. 1973. *Mathematical Structures of Social Mobility*. San Francisco: Jossey Bass

Box GED, Jenkins GM, Reisel GC. 1994. *Time Series Analysis*. Englewood Cliffs NJ: Prentice Hall

Brent EE, Sykes RE. 1979. A mathematical model of symbolic interaction between police and suspects. *Behav. Sci.* 24:388–402

Burger JM. 1986. Desire for control and the illusion of control. *J. Res. Pers.* 20:66–76

Burgstahler D, Noreen EW. 1986. Detecting contemporaneous security market reactions to a sequence of related events. *J. Acct. Res.* 24:170–86

Campbell RL, Richie DM. 1983. Problems in the theory of developmental sequences. *Hum. Dev.* 26:156–72

Carley K. 1991. Textual analysis using maps. Unpublished paper, Carnegie Mellon Univ.

Carley K, Palmquist M. 1992. Extracting, representing, and analyzing mental models. *Soc. Forc.* 70:601–36

Carlson WB, Gorman ME. 1992. Socio-technical graphs and cognitive maps. *Soc. Stud. Sci.* 22:81–89

Carmines EG, Stimson JA. 1986. On the structure and sequence of issue evolution. *Am. Polit. Sci. Rev.* 80:901–20

Carpenter DP. 1994. The structural and institutional foundations of bureaucratic culture. Ms. Brookings Inst.

Chan TW. 1994. Tracing typical mobility paths. Ms. Nuffield Coll. Oxford

Chand S, Chhajed D. 1992. A single machine model for determination of optimal due dates and sequence. *Op. Res.* 40:596–602

Chase I. 1991. Vacancy chains. *Annu. Rev. Sociol.* 17:133–54

Chateau-Raynaud F. 1990. Une machine interpretative. Unpublished. Centre d'Etudes de l'emploi. Noisy-le-Champs, France

Chatman S. 1978. *Story and Discourse*. Ithaca: Cornell Univ. Press

Cohen A, Ivry RI, Keele SW. 1990. Attention and structure in sequence learning. *J. Exp. Psychol. LMC* 16:17–30

Cohn JF, Tronick EZ. 1987. Mother-infant face-to-face interaction. *Dev. Psychol.* 23: 68–77

Collins LM, Cliff N, Dent CW. 1988. The longitudinal Guttman simplex. *Appl. Psychol. Meas.* 12:217–30

Corsaro WA, Heise DR. 1990. Event structures from ethnographic data. In *Sociological Methodology 1990*, ed. C Clogg, pp. 1–57. Oxford: Basil Blackwell

Coxon APM. 1988. Something sensational. *Sociol. Rev.* 36:353–67

Cressey PG. 1932. *The Taxi Dance Hall*. Chicago: Univ. Chicago Press

Crown PL. 1991. Evaluating the construction sequence and population of Pot Creek pueblo, northern New Mexico. *Am. Antiq.* 56:291–314

Danto AC. 1985. *Narration and Knowledge*. New York: Columbia Univ. Press

Davis JH, Kameda T, Parks C, Stasson M, Zimmerman S. 1989. Some social mechanics of group decision-making. *J. Pers. Soc Psychol.* 57:1000–12

Delbono, F. 1989. Market leadership with a sequence of history dependent patent races. *J. Indust. Econ.* 38:95–101

Deltito JA, Argyle N, Buller R, Nutzinger D, Ottosson J-O, et al. 1991. The sequence of

REFERENCE

improvement of the symptoms encountered in patients with panic disorder. *Compr. Psychiatry* 32:120–29

Dewatripont M. 1987. The role of indifference in sequential models of spatial competition. *Econ. Letters* 23:323–28

Dietterich TG, Michalski RS. 1985. Discovering patterns in sequences of events. *Artific. Intell.* 25:187–232

Dilts DM, Ramsing KD. 1989. Joint lot sizing and scheduling of multiple items with sequence-dependent setup costs. *Decision Sci.* 20:120–33

Dobson G. 1992. The cyclic lot scheduling problem with sequence-dependent setups *Op. Res.* 40:736–49

Duncan S, Farley AM. 1990. Achieving parent-child coordination through convention. *Child Dev.* 61:742–53

Eder D, Enke JL. 1991. The structure of gossip *Am. Sociol. Rev.* 46:494–508.

Edwards L. 1927. *The Natural History of Revolutions*. Chicago: Univ. Chicago Press

Ellickson PL, Hays RD, Bell RM. 1992. Stepping through the drug use sequence. *J. Abnorm. Psychol.* 101:441–51

Faedda GL, Baldessarini RJ, Tohen M, Strakowski SM, Waternaux C. 1991 Episode sequence in dipolar disorder and response to lithium treatment. *Am J. Psychiatr.* 148:1237–39

Fararo TJ. 1993. Generating narrative forms. *J. Math. Sociol.* 18:153–81

Fararo TJ, Skvoretz J. 1984. Institutions as production systems. *J. Math. Sociol.* 10:117–82

Fleming JH, Darley JM. 1990. The purposeful-action sequence and the "illusion of control."*Pers. Soc. Psychol. Bull.* 16:346–57

Forrest J, Abbott A. 1990. The optimal matching method for anthropological data. *J. Quant. Anthropol.* 2:151–70

Foster V, Sprinthall NA. 1992. Developmental profiles of adolescents and young adults choosing abortion. *Adolescence* 27:655–73

Franzosi R. 1990. Computer-assisted coding of textual data. *Soc. Meth. Res.* 19:225–57

French-St.George M, Bregman AS. 1989. Role of predictability of sequence in auditory stream segregation. *Percept. Psychophysics* 46:384–86

Garcia-Colera A, Semjen A. 1987. The organization of rapid movement sequences as a function of sequence length. *Acta Psychol.* 66:237–50

Gardiner P. 1959. *Theories of History*. Glencoe IL: Free Press

Gisiner R, Schusterman RJ. 1992. Sequence, syntax and semantics. *J. Compar. Psychol.* 106:78–91

Grenzebach AP, McDonald JE. 1992. Alphabetic sequence decisions for letter pairs with separations of one to three letters. *J. Exp. Psychol. LMC* 18:865–72

Gribskov M, Devereux J. 1992. *Sequence Analysis Primer*. New York: Freeman

Griffin L. 1993. Narrative, event structure analysis and causal interpretation in historical sociology. *Am. J. Sociol.* 98:1094–133

Griffin LJ. 1993. Introduction to ETHNO. *Contemp. Sociol.* 22:295–96

Gupta JND, Darrow WP. 1986. The two-machine sequence dependent flowshop problem. *Eur. J. Op. Res.* 24:437–46

von Heijne G. 1987. *Sequence Analysis in Molecular Biology*. San Diego: Academic

Heise D. 1989. Modeling event structures. *J. Math. Sociol.* 14:139–69

Heise D. 1991 Event structure analysis. In *Using Computers in Qualitative Research,* ed. N Fielding, R Lee, pp. 136–63. Newbury Park CA: Sage

Hodson FR, Kendall DG, Tautu P, eds. 1971. *Mathematics in the Archeological and Historical Sciences*. Edinburgh: Univ. Edinburgh

Hoel M. 1987. Bargaining games with a random sequence of who makes the offers. *Econ. Letters* 24:5–9

Hopp WJ. 1987. A sequential model of R&D investment over an unbounded time horizon. *Manage. Sci.* 33:500–8

Hue C-W, Erickson JR. 1991. Normative studies of sequence strength and scene structure of 30 scripts. *Am. J. Psychol.* 104:229–40

Hughes E. 1928. *The Growth of an Institution*. PhD thesis, Univ. Chicago

Inhoff AW. 1986. Preparing sequences of saccades under choice reaction conditions. *Acta Psychol.* 61:211–28

Isaac L, Carlson SM, Mathis MP. 1991. *Quality of quanitity in comparative historical time series analysis*. Presented at Soc. Sci. Hist. Assoc., New Orleans, 2 Nov 1991

Jones SE, Bram PF. 1985. An illustration of a simple sequence analysis with reference to the agonistic behavior of four strains of laboratory mice. *Behav. Proc.* 11:365–88

Jonz J. 1989. Textual sequence and second-language comprehension. *Lang. Learning* 39: 207–49

Karlin S, Bucher P, Brendel V, Altschul SF. 1991. Statistical methods and insights for protein and DNA sequences. *Annu. Rev. Biophys. Biophys. Chem.* 20:175–203

Kosaka K. 1993. Toward a further analysis of narratives. *J. Math. Sociol.* 18:141–51

Kreps DM, Wilson R. 1982. Sequential equilibria. *Econometrica* 50:863–94

Lamb ME, Malkin CM. 1986. The development of social expectations in distress-relief sequences. *Int. J. Behav. Dev.* 9: 235–49

Latour B, Mauguin P, Teil G. 1992. A note on sociotechnical graphs. *Sociol. Stud. Sci.* 22: 33–57

Laufer B. 1990. Sequence and order in the development of the L2 Lexis. *Appl. Linguist.* 11.281–96

Lawrence CE, Altschul SF, Boguski MS, Liu JS, Neuwald AF, Wootton JC. 1993. Detecting subtle sequence signals. *Science* 262: 208–14

Levitt B, Nass C. 1989. The lid on the garbage can. *Admin. Sci. Q.* 34:190–207

Lister C, Leach C, Hill J. 1990. Sequence and structure in the concept development of children with emotional and behavioral difficulties. *J. Genet. Psychol.* 151:287–300

Manderscheid RW, Rae DS, McKarrick AK, Silbergeld S. 1982. A stochastic model of relational control in dyadic interaction. *Am. Sociol. Rev.* 47:62–75

Marks LJ, Kamine MA. 1988. The use of product sampling and advertising *J. Market. Res.* 25:266–81

Marks LJ, Kamins MA. 1990. The use of product sampling and advertising. *J. Market. Res.* 25:266–81

Mayhew BH, Gray LN, Mayhew ML. 1971. Behavior in interactional systems *Gen. Syst.* 16:13–29

Mayhew BH, Levinger RL. 1976. On the frequency of oligarchy in human interaction *Am. J. Sociol.* 81:1017–49

Mays VM. 1986. Developmental sequence in black women's small groups. *Int. J. Small Group Res.* 2:94–99

McBrearty S. 1988. The Sangoan-Lupemban and Middle Stone Age sequence at the Muguruk Site, Western Kenya *World Archeol.* 19:389–420

Meier RC, Johnson RA, Newell WT, Schreiber AN. 1982. Midcentral foods. In *Cases in Production and Operations Management.* Englewood Cliffs NJ: Prentice Hall

Miller LJ, Roid GH. 1993. Sequence comparison methodology for the analysis of movement patterns in infants and toddlers with and without motor delays. *Am J. Occup. Ther.* 47:339–47

Mishler EG. 1986. The analysis of interview-narratives. In *Narrative Psychology,* ed. TR Sarbin, pp. 233–55. New York: Praeger

Mishler EG. 1990. Validation in inquiry-guided research. *Harv. Educ. Rev.* 60:415–42

Mullen B, Driskell JE, Smith C. 1989. Availability and social projection. *Pers. Soc. Psychol. Bull.* 15:84–90

Nakai T. 1986. An optimal selection problem for a sequence with a random number of applicants per period. *Op. Res.* 34:478–85

Natsopoulos D, Abadzi H. 1986. Understanding linguistic time sequence and simultaneity. *J. Psycholinguist. Res.* 15:243–73

Ney PG. 1987. The treatment of abused children. *Am. J. Psychother.* 41:391–401

Oliver PE. 1993. Formal models of collective action. *Annu. Rev. Sociol.* 19:271–300

Oppenheimer L, DeGroot M. 1985. Construction and reconstruction of social event sequences. *Psychol. Rep.* 56:511–18

Oppenheimer L, Lee HVD. 1983. Social perspective taking and event sequences. *Psychol. Rep.* 53:683–90

O'Rand AM, Krecker ML. 1990. Concepts of the life cycle. *Annu. Rev. Sociol.* 16:241–62

Padgett J. 1981. Heirarchy and ecological control in federal budgetary decision making. *Am. J. Sociol.* 87:75–129

Park O-C, Tennyson RD. 1986. Computer-based response-sensitive design strategies for selecting presentation form and sequence of examples in learning of coordinate concepts. *J. Educ. Psychol.* 78:153–58

Parker KCH. 1988. Speaking turns in small group interaction. *J. Pers. Soc. Psychol.* 54: 965–71

Peake PK, Cervone D. 1989. Sequence anchoring and self-efficacy. *Soc. Cognition* 7:31–50

Pittenger DJ, Pavlik WB, Flora SR, Kontos J. 1988. Analysis of the partial reinforcement extinction effect in humans as a function of sequence of reinforcement schedules. *Am. J. Psychol.* 101:371–82.

Polich J. 1987. Comparison of P300 from a passive tone sequence and an active discrimination task. *Psychophysiology* 24:41–46

Poole MS. 1989. Decision development in small groups. *Hum. Commun. Res.* 15:549–89

Poole MS. 1993. Sequences in decision groups. Ms. Dep. Speech & Commun., Univ. Minn. Minneaplis

Rashevsky N. 1968. *Looking at History through Mathematics.* Cambridge, MA: MIT Press

Read SJ, Druian PR, Miller LC. 1989. The role of causal sequence in the meaning of actions. *Br. J. Soc. Psychol.* 28:341–51

Ricoeur P. 1984–1985. *Time and Narrative.* Chicago: Univ. Chicago Press

Rosenfeld RA. 1992. Job mobility and career processes. *Annu. Rev. Sociol.* 18:39–61

Ryle A. 1991. Object relations theory and activity theory. *Br. J. Med. Psychol.* 64:307–16

Saberwahl R, Robey D. 1993. An empirical taxonomy of implementation processes based on sequences of events in information system development. *Org. Sci.* 4:548–76

Sampson RJ, Laub JH. 1993. *Crime in the Making.* Cambridge: Harvard Univ. Press

Sankoff D, Kruskal JB. 1983. *Time Warps. String Edits, and Macromolecules.* Reading MA: Addison-Wesley

Schank R, Abelson R. 1977. *Scripts Plans, Goals and Understanding.* Hillsdale NJ: Lawrence Erlbaum

Scott JK. 1992. Exploring socio-technical analysis. *Soc. Stud. Sci.* 22:59–80

Shaw C. 1930. *The Jackroller.* Chicago: Univ. Chicago Press

Skvoretz J, Fararo TJ. 1989. Action structures and sociological action theory. *J. Math. Sociol.* 14:111–37

Staw BM, Ross J. 1989. Understanding behavior in escalation situations. *Science* 246:216–20

Stewman S. 1976. Markov models of occupational mobility. *J. Math. Soc.* 4:201–45, 247–78

Stoltman JJ, Gentry JW, Anglin KA, Burns AC. 1990. Situational influences on the consumer decision sequence. *J. Bus. Res.* 21:195–207

Stovel K. 1994. The structure of lynching. Ms. Dep. Sociol. Univ. N. Carolina, Chapel Hill

Terrace HS. 1986. Positive transfer from sequence production to sequence discrimination in a nonverbal organism. *J. Exp. Psychol. ABP* 12:215–34

Thrasher FM. 1927. *The Gang*. Chicago: Univ. Chicago Press

Tolstoy P, DeBoer WR. 1989. An archeological sequence for the Santiago-Cayapas River basin, Esmeraldas, Ecuador. *J. Field Archeol.* 16:295–308

Trabasso T, Nickels M. 1992. The development of goal plans of action in the narration of a picture story. *Discourse Proc.* 15:249–75

Treisman M, Williams TC. 1984. A theory of criterion setting with an application to sequential dependencies. *Psychol. Rev.* 91:68–111

van Leeuwen C, Bufart H, van der Vegt J. 1988 Sequence effects on the organization of meaningless serial stimuli. *J. Exp. Psychol.* 14:481–502

Vasudev J, Hummel RC. 1987. Moral stage sequences and principled reasoning in an Indian sample. *Hum. Dev.* 30:105–118

Vickers J. 1986. The evolution of market structure when there is a sequence of innovations. *J. Indust. Econ.* 35:1–12

Vingron M, Waterman MS. 1994. Sequence alignment and penalty choice. *J. Mol. Biol.* 235:1–12

Vucinich S. 1984. Sequencing and social structure in family conflict. *Soc. Psychol. Q.* 47: 217–34

Wagner RA. 1983. On the complexity of the extended string-to-string correction problem. In Sankoff & Kruskal 1983, pp. 215–35

Waterman RW, Oppenheimer BI, Stimson JA. 1991. Sequence and equilibrium in congressional elections. *J. Polit.* 53:372–93

Weintraub S, Baer MD. 1992. The interplay beween economic and political opening. *Wash. Q.* 15:187–201

White HC. 1970. *Chains of Opportunity*. Cambridge: Harvard Univ. Press

Winn W. 1988. Recall of the pattern, sequence, and names of concepts presented in instructional diagrams. *J. Res. Sci. Teach.* 25:375–86

Wold AH, Reinvang I. 1990. The relation between integration, sequence of information, short-term memory and token test performance of aphasic subjects. *J. Commun. Disord.* 23:31–59

Wyer RS, Shoben EJ, Fuhrman RW, Bodenhausen GV. 1985. Event memory. *J. Pers. Soc. Psychol.* 49:857–77

Yamaguchi K. 1991. *Event History Analysis*. Newbury Park CA: Sage

Zhang K, Shasha D. 1989. Simple fast algorithms for the editing distance between trees and related problems. *SIAM J. Comput.* 18: 1245–62

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SOCIAL STRUCTURE AND THE PHENOMENOLOGY OF ATTAINMENT

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ABSTRACT

Reviews of recent research on the transmission of socioeconomic advantage have decried the increasing "narrowness" of the field. This chapter focuses on an alternative proposition, namely, that there is now a large enough body of work seeking fundamentally to reorient the field of social attainment studies that it is useful to identify commonalities as well as distinctive features. Conceptualization and operationalization of "social structure" in recent stratification research is the point of departure. Special attention is given to contemporary efforts to formulate a new phenomenology of attainment. In light of the many connections that are illuminated when these diverse strands are brought together, it is worthwhile to review them within the same scope and to discuss the prospect that they will form into a single specialty area within sociology.

INTRODUCTION

During the past two decades several varieties of "structural" research and criticism of the status attainment paradigm have flourished within sociology. Reviews and appraisals of the seminal 1967 monograph of Blau & Duncan include those by Horan (1978), Bielby (1981), Haller (1982), Knottnerus (1987), Blau (1992), Nakao (1992), and Sewell & Hauser (1992). Beginning in the mid-1970s many investigators maintained that structures of positional inequality such as class, job authority in the workplace, industrial and labor

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market sectors, and relative organizational size are both more important than and logically prior to individual attainment. By 1980 Baron & Bielby had applied the term "new structuralists" to these researchers, noting their general lack of explicit conceptualization of structure and the absence of a sustained focus on stratification mechanisms at the firm level. Reviews of subsequent work include Baron (1984, 1994), AB Sørensen (1986, 1991), Althauser (1989), Breiger (1990a), Rosenbaum (1990), Averitt (1992), Bielby (1992), and Abbott (1993).

Despite the increased realism in our understanding of individuals' achievements that has resulted from these lines of structural work, Burton & Grusky (1992:623) point out that the "new structuralist" critics of Blau & Duncan favor comparison of attainment parameters across subpopulations defined by industrial or organizational variables, whereas Blau & Duncan in fact carried out many comparisons, but of different kinds: across regions, nation-states, and historical time. Given its prominent emphasis on cohort comparisons and its somewhat less prominent attention to societal comparisons, status-attainment research cannot fairly be said to ignore changing structures entirely (AB Sørensen 1986:84). Nonetheless, many criticisms from the early 1980s of how "structure" should shape the study of individual attainment are still valid.

This chapter reviews and assesses ways in which "social structure" has been conceptualized and operationalized in recent stratification research. The centrality of this topic to sociological inquiry is reflected in the large number of recent reviews of overlapping problems: the changing structure of modern stratification and mobility (Erikson & Goldthorpe 1992a:1–27, Grusky 1994a, Kerckhoff 1995), class mobility and structure (Kurz & Müller 1987, Myles & Turegun 1994), sex differences in earnings (Marini 1989), women's labor force participation, attainment, and class distribution (Treas 1987, A Sørensen 1994), sex segregation in the workplace (Reskin 1993), internal labor markets (Althauser 1989), ethnicity and entrepreneurship (Aldrich & Waldinger 1990), ethnic inequality (Waters 1995), concepts and measurement of prestige (Wegener 1992), models and methods (see Chase 1991 on vacancy chains, Goodman & Clogg 1992 on mobility tables, and Petersen 1992, 1993 on longitudinal processes), implications of life course transitions for stratification (O'Rand & Krecker 1990, Elder 1992, Moen & Wethington 1992, Entwisle & Alexander 1993), job mobility and career processes (Rosenfeld 1992), and the past 40 years of comparative research on intergenerational transmission of socioeconomic advantage (Ganzeboom et al 1991, Burton & Grusky 1992).

In light of the sustained treatment of many aspects of my topic provided by the above-cited reviews, I begin with a conclusion of Ganzeboom et al (1991: 278): that "with respect to problem development and theory formulation the field has become excessively narrow" (see also Rosenfeld 1992:57). My emphasis, therefore, is on contemporary analyses from several different perspectives that have, in important respects, converged in efforts to replace the conventional study of attainment with inquiry centered around the formulation of a new phenomenology of attainment.

CONTRASTS IN IMAGERY Phenomenology may be defined as investigation of the ways in which common-sense knowledge about society feeds back, through social action, into the molding of society itself, including the fashioning of concepts for social analysis (Schütz 1967). Phenomenology concerns the degree of "fit" between the world and our concepts about the world. Sociology today is engaged in a period of fundamental phenomenological debate, controversy, and reorientation, the relevance of which for social attainment studies deserves both exposition and critique. Contemporary social analysts are struggling to articulate apt metaphors, appropriate images for the social and societal transformations of the present, and to incorporate these images within rigorous analytical schemes. Examples include: "constructed social organization" and the rise of corporate actors (Coleman 1990, 1991, 1993), modernity as a set of culturally theorized notions that help explain homogeneity of stratification regimes across nations and time (Meyer 1994), moebius-strip organizations (Sabel 1991), structural holes (Burt 1992a), recombinant property (Stark 1994), robust action (Padgett & Ansell 1993), the fuzzy logic of practical sense (Wacquant 1992), ambiguity vs ambage (White 1992a), the reflexive relation of social structure and interaction (Wilson 1991), relative prices and theories of social production functions and non–given alternatives (Lindenberg & Frey 1993), interdependent networks of work organizations (Namboodiri & Corwin 1993), and the network organization (Baker 1992). Indeed, on the issue of phenomenology, White (1992a:98) recommends that "rationality and identity are so much about perception and intention that we can turn for additional help to interpretive techniques such as discourse analysis." And Meyer (1994: 732) emphasizes that it is the cultures of modern societies that tend to make stratification theories important, rather than the theorists simply having "some sort of mysterious dominance" over the culture; carriers of theories include ordinary members as well as political elites and specialized intellectuals.

There is now a large enough body of work seeking fundamentally to reorient the field of social attainment studies that it is useful to search for commonalities as well as distinctive features. Each of the two major sections of this chapter is framed by a contrast in imagery.

SYSTEMS OF ACTION AND STRUCTURES OF ATTAINMENT

An important juxtaposition of images underlies recent work of Coleman (1990, 1991): that of "structure" *in opposition to* "individual attainment." Coleman (e.g. 1991:3–4) contrasts recent nationally representative studies of individual attainment with an earlier tradition of stratification research based on community probes such as Lynd & Lynd's 1929 study of Middletown. In the earlier studies, analysis of community structure was synthetic, qualitative, concerned with the subjective views of persons located at different points in the structure, and regarded persons within the system as acting purposively to make use of their resources. In sharp contrast, the more recent national studies of attainment take individual persons as the fundamental units; these studies are analytical and quantitative, provide no subjective views, and regard persons not as purposeful actors but as intersections of variables linked together in causal relations.

Movement from the first set of attributes to the second set captures for Coleman some aspects of the transformation of social research in general over the past half century and points to two sources of distress. One of these is "a loss of capacity to study a social system as a system, and a fallback to a much simpler task that is less central to the discipline: the task of characterizing the trajectories of individuals who are within the system." The other is "loss of the capacity to see actions as they are seen by the actors themselves, leaving our view limited to that of the outside observer" (Coleman 1991:4).

Rational Choice

As an example of the new kinds of research specifically focused on social attainment that become possible within Coleman's rational choice approach, consider representative national data from the General Social Survey on certain characteristics of jobs (the wages and occupational prestige of the job held by each employed member of the sample) and certain attributes of workers (education, experience, marital status, gender, race). Assume that in the US labor market workers have an interest in only the above-mentioned attributes of a job, and that employers have an interest in the workers' attributes listed above. Assume that the labor market is in equilibrium, in that the value of a worker's resources in the labor market equals the value of the resources of that worker's job. Then, using survey data on existing wage differentials, it is possible to calculate the value of each of these attributes of workers and jobs, as Coleman (1991) does. These estimates appear no different in kind from the sort of information obtained in typical status attainment studies. However, it is also possible to use this framework to study the effect of a demographic change on the distribution of workers in jobs (as, for example, when new entrants are more highly educated than those who retire), or the effect of a change in the occupational structure on the distribution of workers in jobs (as, for example, when unionized craft jobs decline in the labor market relative to the growth of low-paying white collar clerical positions).

The heart of the data analysis procedure is the equilibrium assumption, which allows the analyst to begin with the set of matches of workers to jobs that is actually found, and "to work backwards toward the set of preferences on both sides that could have resulted in this set of matches" on the basis of a matching algorithm that minimizes some function of the difference between the value of a worker's resources and the value of the resources of the job that the person holds (Coleman 1991:6; see also Coleman & Hao 1989, Burgess 1994, Hersch & Davis 1994). Thus, Coleman (1991:12) argues that, unlike the typical status attainment studies, the rational choice approach "opens out into an analysis of the labor market as a full-blown system of action in which the value of a given worker in the labor market does not depend only on the resources that that worker alone brings to the market, but upon the resources of other workers in the market, their interests in particular job resources, and the distribution of job resources" (see also Coleman 1990:713–17). A newly emergent area of research has been the mutual articulation of approaches that are usually termed "structuralist" and "rational choice." Coleman (e.g. 1990: 300–21) has contributed to this research, and Scharpf (1993) is a useful collection of papers, especially the study of Pappi et al (1993). More general implications of rational choice assumptions for the study of attainment include investigation of the production of macrolevel social order from the local dynamics of competition among groups for resources and members (Hechter et al 1992) and studies of the effects of transaction costs and the structuring of property rights on market forces (Williamson 1991, Nee 1992) and on the financial organization of married life (Treas 1993).

Organizational Ecology

In contrast to the position usually adopted by rational choice theorists that natural persons are the relevant "lower" or "ultimate" units of analysis, organizational ecology is an approach to the macrosociology of organizations that builds on general ecological and evolutionary models of change in populations and communities of organizations (Hannan & Freeman 1989, Hannan 1992). Organizational ecology is relevant for the study of attainment not only in providing linkages between firm-level labor practices, industry effects, mobility as turnover, and individual-level career dynamics (Brittain & Wholey 1990; see also Blossfeld 1986, Carroll & Mayer 1986), but also in establishing a framework for analyzing systems of organizations that provide the arenas within which individuals strive to get ahead. A key concept for the latter set of activities is that of "cross effects" (Hannan & Freeman 1989:220–24, Hannan & Carroll 1992:98–101), a network of coefficients measuring competition for resources among bounded organizations. Hannan and collaborators have dynamically modeled competition between American craft and industrial unions over a 150-year period (e.g. Hannan & Carroll 1992:99–115).

It seems likely (Hannan & Carroll 1992:202) that analyses of interrelations among subpopulations within an organizational-ecology context, with a focus on competitive and legitimizing processes, will be relevant for images such as Abbott's (1988) of professions as a system of interdependent occupations contending for status and control, rather than as isolated social entities. Haveman & Cohen (1994) seek to reframe research on career mobility by explaining changes in opportunity structures by means of vital events of populations of organizations (foundings, dissolutions, mergers); their study of career dynamics in the California savings and loan industry demonstrates strong effects of industry structure on career processes. Furthermore, it is now possible to relate patterns of contention within social movements to the dynamics of organizational populations and to the differential impact of the economy on ethnic groups (Olzak 1992, Olzak et al 1994). A main task of contemporary research within organizational ecology is to develop "explicit links to the rapidly growing corpus of methods for analyzing data on social networks" (Hannan & Freeman 1989:340), including, presumably, the distinct theories of McPherson et al (1992) and of Burt (1992a:208–25) on social networks and organizational dynamics.

Work, Cultures, and Careers

Kalleberg & Stark (1993) argue that, in both the United States and Hungary, individuals' career strategies and attainments are shaped by their nation's structures of employment relations. (Trends in occupational mobility in Hungary under socialism are analyzed in Wong & Hauser 1992. A comparison of firms in the United States and Hungary, based on case studies of two comparable firms, is the subject of Burawoy & Lukács 1985.) For example, the worth of capitalist managers is measured by profits earned, whereas the value of socialist directors is assessed by the size of their budget (the magnitude of resources under the redistributive authority of the manager). Analysis of comparative data from the 1989 International Social Survey Program indicates that Hungarians place greater importance on economic incentives and on having more "leisure" time from their main jobs, time which they can then presumably use to maximize their earnings in second-economy jobs. Workers in the United States are more concerned with promotion and advancement opportunities. Careers in internal labor markets in capitalist societies feature bureaucratized job categories and routinized promotions, while workers' careers in bureaucratic socialism are structured far less along the lines of routine promotion and more around "the circles of affiliated networks" (Kalleberg & Stark 1993:185). Implications for career strategies may also be found in the comparative study of Lincoln & Kalleberg (1990) of factories and workers in a region of the United States and a region of Japan, though the emphasis in the earlier study is on work attitudes and worker commitment to firms.

The Political Economy Thesis

Within the set of contributions of North American social scientists formulated from the 1960s through the 1980s that Erikson & Goldthorpe (1992a:3–9, 366–69) discuss under the general rubric of "the liberal theory of industrialism," Treiman's (1970) is particularly prominent. His thesis is that the criteria for status attainment tend to shift from ascribed to achieved factors as a society becomes more industrialized. Hout (1989:7–8) reviews the general lack of empirical support for this thesis (see also Fukumoto & Grusky 1993).

In a major reconceptualization and new challenge mounted at the "industrialization-attainment thesis," Lin & Bian (1991) argue that political economy determines the stratification system of any society. In particular, segmentation of economic and labor structures is not unique to societies with market economies. For China and Eastern Europe, Lin & Bian review evidence of lessening effects of parental status on attainments, while data from industrialized nations (e.g. Blau & Duncan 1967, Treiman & Yip 1989) show that the direct effects of parental status on respondents' job status are at least as strong as those found in China, Hungary, and Poland, in contradiction to the anticipation of the industrialization-attainment thesis (Lin & Bian 1991:660).

Lin & Bian argue that reduction of the parental status effects in China is a consequence of political economy and state policies rather than an outcome of industrialization. In analysis of a representative urban sample from Tianjin, Lin & Bian find that entrance into core sectors (state agencies and enterprises), rather than the specific job itself, constitutes the primary goal of status attainment. They formulate and test models of status attainment that include work-unit sector as well as occupation, in order to examine the relative contributions of these status criteria and to assess the influence of ascribed and achieved characteristics (cf Lin & Xie 1988). They argue that segmentation phenomena, which take a variety of forms across a wide range of societies, are more than macrostructural features; they provide important sources of identification for the individual workers striving for attainment. Within this basic context of cross-societal variation, Lin & Bian suspect that two features may nonetheless be present in all societies: gender differences (for which the industrialization thesis has no explicit provision) and the use of social networks and social resources (see also Lin 1990). Personal choices and relations in China seem remarkably similar to those in the United States, quite possibly because particularism governs personal relations regardless of cultural, political, or economic differences (Blau et al 1991).

In societies with market economies and capitalist states, the attributes of an individual such as detailed occupation title and income will no doubt remain significant in understanding status attainment. "It, nevertheless, becomes critical that segmentation identification, meaningfully constructed according to the political economy associated with each society, be adopted as a status variable" in order properly to assess the relative effects across societies of ascribed versus achieved characteristics in the status attainment process (Lin & Bian 1991:683).

POLITICAL ECONOMY AT THE STATE LEVEL Recent years have seen an expansion of research on the rise and fall of political alliances that contend over state policies that affect socioeconomic attainment (e.g. Skocpol 1992, 1993). "New institutional" analysts of organizations accord sustained attention to the shaping of organizations and the workplace by means of state regulation (for example, Sutton et al 1994). Research of Lin & Bian expands the repertoire of "new structuralist" approaches by opening them to consideration of political economy at the state level. Related work in the area of political economy, state policies, and attainment includes Nee's market transition theory and research in rural China (1989, 1991), establishing that the shift from hierarchies to markets in a socialist economy involves changes in the determinants of socioeconomic attainment and therefore in sources of power and privilege (Nee 1989:679). Peng (1992) compares public and private industrial sectors with respect to wage determination in both rural and urban China. Róna-Tas (1994) concludes from analysis of panel survey data that during the transition from socialism in Hungary ex-communist cadres maintained their advantageous position, in part by converting past political power into economic advantage. Pong (1993) examines the effects of Malaysia's preferential educational policies on secondary school attainment for the country's three main ethnic groups. Dronkers (1993) examines two cohorts of Dutch male pupils in an investigation of the consequences of an educational reform policy in the Netherlands for the effect of parental occupation on attained education. Raftery & Hout (1993) study consequences of a reform in Irish education (the ending of tuition charges for secondary education in 1967) for equality of educational opportunity, focusing on imputedly rational decisions of individual students and their families as providing an explanation for persisting aggregate inequality.

There is a contemporary resurgence of research on state structures and patterns of mobility. In contrast to usual models of state formation, which assume that the main pressures for state building come from the center, Bearman's (1993) study of one English county from 1550 to 1640 documents how breakdown of local elite kinship networks provided mechanisms for the formation of new relations and rhetorics consistent with the creation of a central state and increased court control over the careers of local county elites. DiPrete (1993) demonstrates the illumination of mobility opportunities that results from taking rigorous account of organizational, industry, macroeconomic, and worker effects. Western (1994) incorporates national differences in public policy and differential position in the world economy into analysis of intergenerational class mobility in five nations. The extremely influential, 12-nation study of Erikson & Goldthorpe (1992a) devotes considerable attention to possible effects of state policies on patterns of mobility. Hout & Hauser (1992:262) provide alternative specification and analysis, finding that "the patterns of structural mobility in Europe differ more by occupation than by nation." In response, Erikson & Goldthorpe (1992b:295–97) endeavor to maintain a contrast between two images, the "mobility" and "achievement" points of view, the former connoting their own emphasis on models of the class structuring of national-level mobility patterns and the latter—which they label "the American Dream"—evoking the image of a hierarchy of status attainment as applied in models of the mobility table. As to the phenomenology of attainment, "we think that debate in the field of stratification and mobility research would be ... made more productive if those pursuing the 'American Dream' were to recognize that ... it is not in itself a fault for other investigators to have ... different conceptions of what macro-sociology can and should aim to achieve" (Erikson & Goldthorpe 1992b:298).

INSTITUTIONS AND ATTAINMENTS OF PRACTICAL ACTORS

DiMaggio (1992) formulates a contrast in imagery between "rational-actor" and "practical-actor" models (compare Powell & DiMaggio 1991:1–38). The latter models, which bear an affinity to the framework of action that may be said to underlie the network blockmodels of White et al (1976; Breiger 1991), derive from a mix of cognitive psychology, ethnomethodology, social constructivism, and a concept of practical reason akin to Bourdieu's (DiMaggio 1992:121–22). DiMaggio (p. 138) proposes to treat these contrasting images of rational and practical action "not as analytic alternatives between which researchers may choose, but as disjunctive aspects of actors' social and cognitive environments." DiMaggio calls for increased attention to the interplay of practical strategies with institutional and cultural embeddings of relational structures. Recent efforts in this direction are reviewed here with reference to their implications for social attainment.

Economic Institutions as Social Constructions

Renewed interest in economic sociology has been a major development within the field during the past decade (Friedland & Robertson 1990, Zukin & DiMaggio 1990). Granovetter (1992a) discerns two trends that have strongly affected the discipline of economics during the past two decades: a return to dominance of the pure neoclassical tradition, and an attempt by economists to broaden substantially the domains of applicability of their subject matter. ["Economics really does constitute the universal grammar of social science," proclaims Hirshleifer (1985:53), quoted by Granovetter (1992a:4).] Much recent work generated by economists is in fact of direct relevance to sociologists interested in careers, industrial incentives, the attainment of executives, and—more generally—theory and research on the interface of the supply and demand "sides" of labor markets (see, e.g. Gibbons & Murphy 1990, 1992, Montgomery 1994, Farkas et al 1994, Hartog & van Ophem 1994).

Granovetter (e.g. 1985, 1990, 1992a,b) identifies the emergence of a "New Economic Sociology" that focuses on the "social construction" (Berger & Luckmann 1966) of core economic institutions. Thus, economic actions are socially situated and embedded in ongoing networks of personal relations rather than carried out by atomized actors, and the pursuit of economic goals is usually accompanied by non-economic ones such as sociability, approval, status, and power (Granovetter 1992a:4).

IMPLICATIONS FOR ATTAINMENT STUDIES The implications for the study of attainment of this emphasis on the social construction of economic institutions are the following. First, research on at least some forms of attainment needs to focus on the embedding of economic activity in networks of personal, organizational, and institutional relations. Analysts as diverse as Coleman (1990:304) and Bourdieu (Bourdieu & Wacquant 1992:119) put forward virtually identical definitions of "social capital" as denoting the resources for social attainment that individuals acquire through networks of mutual acquaintance, obligation, and information channeling. Relevant here is the considerable body of cross-national research on the impact of social networks and the transmission of job information on income and occupational attainment (reviewed in Coleman 1990:302, Lin 1990:250–52, Burt 1992b:58–61) and on the organizational side of job searches (Marsden & Campbell 1990). This research illuminates concrete mechanisms by which individuals are linked to larger structures through organizations and labor markets.

Second, much new research on the social construction of economic institutions focuses on networks of relations among governmental and economic actors at the level of entire economies. Examples include Gerlach's (1992b) blockmodel network analysis of Japanese firms (see also Gerlach 1992a, Gerlach & Lincoln 1992); elaboration by several researchers (Burawoy & Krotov 1992; Stark 1989, 1992a, 1992b; Bruszt & Stark 1991) of how routine social practices, existing organizational forms, and network ties are transformed into assets and resources in post-communist East European societies; and Biggart & Hamilton's (1992) critique of the relevance of firm-based theory for study of East Asian economies. Rather than focusing societal studies of economic action on "the individual's aspiration for entrepreneurship," Stark (1992a:303) urges a reorientation that would recognize that "entrepreneurs are produced and reproduced in networks of affiliation; these networks are the proper object of study."

Third, "the rise of market culture" (Reddy 1984) is a promising arena in which to study the interaction of official and informal encoding of attainment processes. [Reddy's study of eighteenth-century French textile mills, as Granovetter (1992b:51) points out, analyzed the disjunction according to which official record-keeping was based on an assumption of market principles, despite the actual continued influence of traditional non-economic motives on both workers and owners.] The constructionist project mandates a concern with how economic forms including particular organizations, markets, and professions are constituted and carry out their affairs. In this regard Warner & Molotch (1993) analyze how explanations offered by the financial press of the stock market crash of October 1987 rely on socially embedded conceptions of markets, rather than on prevailing doctrines of economic or financial theory. In a sense developed by the authors, media coverage constitutes the market through its accounts of it. Recent work on talk and institutions is collected in Boden & Zimmerman 1991:93–192; see also Molotch & Boden 1985. Studies such as these making use of conversation analysis, and others from a seemingly quite different tradition that focus on the "theorization" of institutional practices (Strang & Meyer 1993) on the part of organizational members and publics, seem at present to be illogically remote from one another.

A fourth implication for attainment studies of this emphasis on social construction is to open up to conceptualization and inquiry the topic of the fairness and legitimacy of attained income as these are influenced by the embedding of economic actors within interpersonal networks. Embedding of illegal economic action in on-going social networks is the problem taken up in Baker & Faulkner (1993). Their study of three well-known price-fixing conspiracies in the heavy electrical equipment industry, on the basis of reconstructions of the conspirators' communications networks from archival data, suggests that the structure of illegal networks is driven primarily by the need to maximize concealment, rather than the need to maximize efficiency (cf Wiegand 1994 on the role of ethnic trading networks in "black markets"). In general, following from ideas of Doeringer & Piore and other writers on internal labor markets (see Gartrell 1987:53), wage comparisons and justice evaluations among workers in the same unit exhibit many interdependencies such that a wage change in one position may create ripple effects throughout the system. Gartrell (1985) analyzes a network of sentiments of collective justice in his study of workers in a municipal public works department. Gartrell's "relational" model complements non-network approaches, including Jasso's (1980) theory of justice and related research (Jencks et al 1988, Jencks 1990) on how people assess their own jobs.

Strategic Action

An important constellation of problems that the new phenomenologists are attempting to chart arises at the intersection of strategy, structure, and attainment.

MANAGING ATTAINMENT STRUCTURES Individuals attempt to manipulate structures and to increase their resources given their structural locations. Burt (1992a:186) emphasizes that the individual as "player" is at once a physical and legal entity and an amalgam of social structural units; Burt, as well as Wilson (1991), postulates that the connection between player and structure is more like a symmetric duality than a series of asymmetric levels. In sharp contrast to the status attainment literature, in which family and education background variables account for a proportion of variation in attainment outcomes (Knottnerus 1987), Burt postulates that higher income returns to education are generated by structural position. Because the positions that players occupy are often correlated with attributes (age, sex, race, and so on), the correlation between attributes and position in social structure creates a correlation between attributes and those outcomes that Burt believes to be generated by the structure. The correlation between outcomes and player attributes is spurious. "It would disappear if the social structural condition responsible for the outcome were held constant" (Burt 1992a:186; on networks and attributes, see also Padgett & Ansell 1993: 1285–86, n. 38). In White's (1992b:95) view, "Much of the literature on problems of management can be reframed as networking puzzles of agency and thereby boiled down and made more tangible."

The paradox of agency and structure (White 1993:115) is that agency, which is conceived and reported as a matter of coupling—for example, connecting actresses with theatre producers—in fact easily becomes a primary source of "decoupling"—as in separating actresses from the shaping of a play as artwork. Separation of the business and artistic domains in the Hollywood film industry arose as filmmakers adapted to the early blockbusters (Baker & Faulkner 1991). White (1992a:257) argues that general theories in the social sciences have "gone at the study of stratification wrongly." Rather than seeing "classes cleanly differentiated by relations to the means of production," or "strata rationally arrayed according to worth of their occupations," White looks in the opposite direction. In White's reading of Eccles & Crane's (1988) study of the agency relationship between investment bankers and issuers of equity, the key lies not in institutional sectors but in structural equivalence as a principle guiding new alliances resulting from erratic searches for takeover targets and cutting across industry and market boundaries. White emphasizes the manipulation or disjunction of structures of careers as a managerial prerogative. Thus, Glasnost in the former USSR entailed disrupting the expectations of routine career advancement held by the relatively small number of social engineers who had been the agents of centralized control (White 1992a:259; and see

White 1993:75–77 on the emergence in nineteenth-century France of the "dealer-critic" system).

These and similar examples of "getting action" by reaching "through" existing social structures illustrate what White (p. 257) takes to be "the central point about inequality," which is that inequality is the by-product of attempts to get action and gain control. The vast range and large number of ways of "getting action" catalogued by White (1992a) reflect the fact that his is in the first instance a work whose own purpose is to offer a new phenomenology to the field of attainment studies and to social science more generally. White's thesis on getting action seems the converse of that of Hechter et al (1992) to the effect that that global order results (in part) from freedom of association and from the deviance generated at the margins of society.

GETTING AHEAD THROUGH STRUCTURAL HOLES In what appears to be a remarkable convergence, both Burt (1992a) and Padgett & Ansell (1993) develop the analysis of a particular family of social structures—termed "structural holes" or "network holes"—and of the implications of these structures for attainment, though neither cites the other (see also Burt 1992b, Padgett 1990). Burt (1992a:25–26) grounds the history of the concept in White's models of vacancy chains; in the blockmodel analysis of White, Boorman, & Breiger, for whom there is an essential asymmetry between ties that are present and the "holes" in a network; and in Granovetter's thesis on "weak ties."

For Burt, by dint of who is connected to whom, holes exist in "the social structure of the competitive arena." These structural holes become "entrepreneurial opportunities for information access, timing, referrals, and control" (Burt 1992a:1–2, 1992b). Players whose network locations are rich in structural holes are said to have high structural autonomy and are postulated to enjoy high rates of return on investments (such as human capital investments for individual persons, or capital investments for firms). The basic implication, for individual players as for managers, is to optimize structures with respect to nonredundant ties. A player's "optimal" position has ties to diverse clumps of the structure, which are themselves at best only weakly tied to one another and which thus benefit only additively rather than multiplicatively from efficient exposure to diverse sources of information (Burt 1992b:67–72). Padgett & Ansell come to a similar concept through their study of political parties and elite networks in fifteenth-century Florence. The Medici party was "an extraordinarily centralized, and simple, 'star' or 'spoke' network system, with very few relations among Medici followers: the party consisted almost entirely of direct ties to the Medici family." An important consequence was that Medici partisans were connected to other partisans almost solely through the Medici themselves, and to the rest of the oligarchic elite only through the intermediation of this family (Padgett & Ansell 1993:1278). Padgett & Ansell are particularly attentive to a multiplex version of the network holes argument, i.e. a version in which different clumps of the structure are accessed through ties of different qualities (marriage, personal loans, patronage, kinship). Padgett & Ansell (993:1280) determine that the Medici segregated their ties to their followers in order to maintain control over them.

Within a contemporary context, implications of structural holes for research on attainment are spelled out in Burt's (1992a:115–180) study of senior managers in a large high-technology firm (see also Burt & Ronchi 1990, Burt & Talmud 1993). The 284 respondents were asked about their contacts in a number of areas inside and outside the firm, and to indicate the relative strength of relationship ("don't mind working with the person," etc). Constraint, the inverse of "structural holes," is measured for a given manager by the extent to which his or her contacts are especially close and have relations exclusively with each other in the manager's network (Burt 1992a:126). Having a network rich in structural holes is associated statistically with managers being promoted sooner than expected on the basis of their personal attributes (sex, rank, seniority) and those of their positions within the firm (plant location, division). Hole effects are found to be most evident for managers operating on a "social frontier" such as field managers (who mediate external relations and those in the firm; p. 130). In the case of the Medici, attainment consisted not of maximizing attributes (Padgett & Ansell 1993:1268–74) but of survival and political control "produced by means of network disjunctures within the elite, which the Medici alone spanned" (p. 1259).

Opportunity-oriented networks composed of many structural holes are not always productive of career advance. For example, Burt (1992a:164–66) found that women and entry-level men who were promoted early are those who have a hierarchical network around a strategic partner. Burt (1992a:82–114) also extends the argument to an analysis of 77 American product markets over a 20-year period, finding that the ratio of net income to total sales increased with the structural autonomy of producers (measured by indicators based on concentration ratios). In a related study, Han (1992) found that structural autonomy is of critical importance with respect to the turnover and stability of firms within US product markets.

RATIONALITY AS THE TERMINATION OF STRATEGY Rationality and appropriate strategy are not always synonyms. Stark (1992a:301) refers to the notion that more-rational institutions can be implemented by conscious design as the "rationalist fallacy." Game theory, an important motor for rational choice analysis, is described by Leifer (1991:v) as "a model for games that do not have to be played." Leifer develops a theory of skill from his study of actual chess playing. Chess tournaments result in an extreme attainment hierarchy. In good chess, the better the game the more likely a draw. Skill at good chess is more than the ability to make rational choices that exploit positional imbalance; it is also the ability to hold off commitment to a farsighted and elaborate plan of action, while engaging in the poking and tweaking that allow observation of one's opponent's skill and, ultimately, force one's competitor to lock into a rational design (Leifer 1991:67–91). In the gloss of White (1992a:85), "clear goals are antithetical to establishing identities."

Leifer (1988:865) argues that the status attainment literature reveals powerful institutional screening and sorting mechanisms but provides no guidance in face-to-face competition with others, which is most intense "where screening and sorting have already run their course." Leifer's emphasis on the element of skill in generating hierarchical roles seems to this reviewer to be highly compatible with Bourdieu's analysis (1984) of "the practical mastery of classification," which "in no way implies the capacity to situate oneself explicitly ... (as so many surveys on social class ask people to do)," but which consists rather of "the competence presupposed by the art of behaving *comme il faut* with persons and things that have and give 'class' ...," as illustrated, for example, by the operation of condescension strategies such as, in French, use of the familiar *tu* form of address (Bourdieu 1984:472). Padgett & Ansell (1993:1307–10) adopt Leifer's (1988, 1991) concept of "local" or "robust" action in their portrayal of the man at the pinnacle of power in Renaissance Florence, Cosimo de' Medici, as located "behind a shroud of multiple identities," a sphinx-like figure whose legitimacy was "above the self-interested fray" and who was able to gain autonomy by bridging the holes across multiple networks of finance, patronage, and kinship.

THE SOCIAL STRUCTURE OF FAILURE Failure is more than the obverse side of the coin of attainment. By implication, mainstream analyses of attainment consider failure to require no special treatment. The new phenomenologists, in contrast, have interesting lines of analysis on the social structure of failure. The most intricately elaborated view is implicated in Bourdieu's concept of the habitus, the "strategy-generating principle" that confronts both the objective reality of an individual's location within a stratification system and the subjective "dispositions" that integrate one's past experience (Bourdieu 1977: 72, 95; Wacquant 1992:18). An insightful example is Bourdieu's (1988:210–225) analysis of obituary notices of graduates of the elite French educational system. As their lives are reviewed in their official obituaries, those who became mere secondary school teachers "rejected the university as much as it excluded them. Any successful socialization tends to persuade agents to collaborate with their own destiny" (Bourdieu 1988:216). Burt's formulation of "the commit hypothesis" (1992a:197–208) is more general, positing that players with little structural autonomy conform more closely to the behavior characteristic of their location in the social structure. Burt demonstrates that entire markets may be characterized with respect to their autonomy, and that more autonomous markets have a "strong" position in that they can persist even despite large deviations from the market's schedule. Han (1995) analyzes the existence of a more variegated system of freedom from imitation at both the top and the bottom of the hierarchy of firms with respect to their choices of corporate auditors. Finally, in what is in effect another instance of the "commit hypothesis," Gustin (1973) proposes that publication of scientific research is a charismatic activity connecting the producer with a transcendent realm of nature, and that the majority of scientists, who publish an average of only one paper or a fraction thereof per individual lifetime, are led by their low attainment to be bound to the core institution of science. Social analysts such as these, all of whom are concerned with the question of how social structure is generated or maintained by processes of low attainment, seem in little contact with one another's ideas.

CONCLUSION

Bringing social structure more closely to bear on the study of individuals' achievements and status attainment continues to be a principal concern of sociology. The advances reviewed in this chapter provide recent contributions and additions that expand our repertoire.

Is there a revolution brewing in the area of research on achievement and social structure? Perhaps so, although with respect to representativeness of data, rigor of research design, and ease by which new analytical frameworks might be adopted by others, there is not yet a counterpart to Blau & Duncan's 1967 classic. The most elaborated empirical applications have been those of Burt (1992a) and Padgett & Ansell (1993). Burt's sustained analyses of data on corporate managers and markets provides the clearest bridge (as it were) between the traditional concerns of status attainment researchers and the "structural holes" phenomenology, and already other innovative researchers are seeking to elaborate his findings that, for example, managers with ties to others within diverse clumps of an organization have earlier promotion prospects. Padgett & Ansell's combination of network, historical, organizational, phenomenological, and quantitative analysis in application to data of unparalleled richness on Renaissance Florence, which historians have amassed, provides an exemplar of a genuinely novel form of sociological inquiry capable of defining a new agenda for research on attainment. Though it is hard to imagine any straightforward emulation of Padgett & Ansell's innovative study of the rise of a party system, productive dialogue on questions of historical sociology and the proper relations among structure, culture, and agency has already begun (Emirbayer & Goodwin 1994; cf DiMaggio 1992).

The ease with which the usual boundaries patrolled by vigilant sociologists—rational choice, organizational ecology, network and structural, and discourse and conversational analysis—have been crossed in this review of new developments suggests that, if indeed there is a revolution under way, it will have little to do with flags of commitment such as these, and much more to do with the new phenomenology of actual societies, perhaps especially those in Eastern Europe in which new networks of recombinant property (Stark 1994) are now being formulated, and with specific research contributions and modeling techniques that are being worked out. The use of matching algorithms (Coleman 1991), queuing models (Boylan 1993), and methods for aggregating social categories (Breiger 1994) may provide some formal guidance to this emerging stream of research that will depend for evaluation of its performance more on the substantive insights gained than on technical acuity, and both of White's recent books (1992a, 1993) are filled with suggestive leads about new models and analytical strategies. It is too early to assess the potential of these developments to produce a sturdy reorientation. However, the oft-proclaimed narrowness of contemporary stratification research has been clearly and significantly challenged.

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Literature Cited

Abbott A. 1988. *The System of Professions: An Essay on the Expert Division of Labor*. Chicago: Univ. Chicago Press

Abbott A. 1993. The sociology of work and occupations. *Annu. Rev. Sociol.* 19:187–209

Aldrich HE, Waldinger R. 1990. Ethnicity and entrepreneurship. *Annu. Rev. Sociol.* 16: 111–35

Althauser RP. 1989. Internal labor markets. *Annu. Rev. Sociol.* 15:143–61

Averitt RT. 1992. The new structuralism. *Contemp. Sociol.* 21:650–53

Baker WE. 1992. The network organization in theory and practice. See Nohria & Eccles 1992, pp. 397–429

Baker WE, Faulkner RR. 1991. Role as resource in the Hollywood film industry. *Am. J. Sociol.* 97:279–309

Baker WE, Faulkner RR. 1993. The social organization of conspiracy: illegal networks in the heavy electrical equipment industry. *Am. Sociol. Rev.* 58:837–60

Baron JN. 1984. Organizational perspectives on stratification. *Annu. Rev. Sociol.* 10:37–69

Baron JN. 1994. Reflections on recent generations of mobiliy research. See Grusky 1994b, pp. 384–94

Baron JN, Bielby WT. 1980. Bringing the firms back in: stratification, segmentation, and the organization of work. *Am. Sociol. Rev.* 45: 737–65

Bearman PS. 1993. *Relations into Rhetorics: Local Elite Social Structure in Norfolk, England, 1540–1640.* New Brunswick, NJ: Rutgers Univ. Press

Berger PL, Luckmann T. 1966. *The Social Construction of Reality.* New York: Doubleday

Bielby WT. 1981. Models of status attainment. *Res. Soc. Strat. Mobil.* 1:3–26

Bielby WT. 1992. Organizations, stratification, and *The American Occupational Structure. Contemp. Sociol.* 21:647–50

Biggart NW, Hamilton GG. 1992. On the limits of a firm-based theory to explain business networks: the western bias of neoclassical economics. See Nohria & Eccles 1992, pp. 471–90

Blau PM. 1992. *The American Occupational Structure*: Reflections after Twenty-five Years. *Contemp. Sociol.* 21:596–98

Blau PM, Duncan OD. 1967. *The American Occupational Structure.* New York: Wiley

Blau PM, Ruan D, Ardelt M. 1991. Interpersonal choice and networks in China. *Soc. Forces* 69:1037–62

Blossfeld H-P. 1986. Career opportunities in the Federal Republic of Germany: a dynamic approach to the study of life-course, cohort, and period effects. *Eur. Sociol. Rev.* 2:208–25

Boden D, Zimmerman DH, eds. 1991. *Talk and Social Structure: Studies in Ethnomethodology and Conversation Analysis.* Berkeley: Univ. Calif. Press

Bourdieu P. 1977. *Outline of a Theory of Practice.* Transl. R Nice. Cambridge: Cambridge Univ. Press

Bourdieu P. 1984. *Distinction: A Social Critique of the Judement of Taste.* Transl. R Nice. Cambridge, MA: Harvard Univ. Press

Bourdieu P. 1988. *Homo Academicus.* Transl. P Collier. Stanford, CA: Stanford Univ. Press

Bourdieu P, Wacquant LJD. 1992. *An Invitation to Reflexive Sociology.* Chicago: Univ. Chicago Press

Boylan RD. 1993. The effect of the number of diplomas on their value. *Sociol. Educ.* 66: 206–21

Breiger RL. 1990a. Introduction: on the structural analysis of social mobility. See Breiger 1990b, pp. 1–23

Breiger RL, ed. 1990b. *Social Mobility and Social Structure.* Cambridge: Cambridge Univ. Press

Breiger RL. 1991. *Explorations in Structural Analysis: Dual and Multiple Networks of Social Interaction.* New York: Garland

Breiger RL. 1994. *Dual aggregation on the basis of relational homogeneity.* Presented at Int. Sunbelt Soc. Networks Conf., 14th, New Orleans

Brittain JW, Wholey DR. 1990. Structure as an environmental property: industry demographics and labor market practices. See Breiger 1990b, pp. 155–82

Bruszt L, Stark D. 1991. Remaking the political field in Hungary: from the politics of confrontation to the politics of competition. *J. Int. Aff.* 45:201–45

Burawoy M, Krotov P. 1992. The Soviet transition from socialism to capitalism: worker control and economic bargaining in the wood industry. *Am. Sociol. Rev.* 57:16–38

Burawoy M, Lukács J. 1985. Mythologies of work: a comparison of firms in state socialism and advanced capitalism. *Am. Sociol. Rev.* 50:723–37

Burgess SM. 1994. Matching models and labor market flows. *Eur. Econ. Rev.* 38:809–16

Burt RS. 1992a. *Structural Holes: The Social Structure of Competition.* Cambridge, MA: Harvard Univ. Press

Burt RS. 1992b. The social structure of competition. See Nohria & Eccles 1992, pp. 57–91

Burt RS, Ronchi D. 1990. Contested control in a large manufacturing plant. In *Social Networks through Time*, ed. J Weesie, H Flap, pp. 121–57. Utrecht, Netherlands: ISOR, Univ. Utrecht

Burt RS, Talmud I. 1993. Market niche. *Social Networks* 15:33–49

Burton MD, Grusky DB. 1992. A quantitative history of comparative stratification research. *Contemp. Sociol.* 21:623–31

Carroll GR, Mayer KU. 1986. Job shift patterns in the Federal Republic of Germany: the effects of class, industrial sector, and organizational size. *Am. Sociol. Rev.* 51: 323–47

Chase ID. 1991. Vacancy chains. *Annu. Rev. Sociol.* 17:133–54

Coleman JS. 1990. *Foundations of Social Theory.* Cambridge, MA: Harvard Univ. Press

Coleman JS. 1991. Matching processes in the labor market. *Acta Sociol.* 34:3–12

Coleman JS. 1993. The rational reconstruction of society: 1992 presidential address. *Am. Sociol. Rev.* 58:1–15

Coleman JS, Hao L. 1989. Linear systems analysis: macrolevel analysis with microlevel data. *Sociol. Methodol.* 20:395–422

DiMaggio P. 1992. Nadel's paradox revisited: relational and cultural aspects of organizational structure. See Nohria & Eccles 1992, pp. 118–42

DiPrete TA. 1993. Industrial restructuring and the mobility response of American workers in the 1980s. *Am. Sociol. Rev.* 58:74–96

Dronkers J. 1993. Educational reform in the Netherlands: Did it change the impact of parental occupation and education? *Sociol. Educ.* 66:262–77

Eccles RG, Crane DB. 1988. *Doing Deals: In-*

vestment Banks at Work. Boston: Harvard Bus. School Press

Elder GH Jr. 1992. Models of the life course. *Contemp. Sociol.* 21:632–35

Emirbayer M, Goodwin J. 1994. Network analysis, culture, and the problem of agency. *Am. J. Sociol.* 99:1411–54

Entwisle DR, Alexander KL. 1993. Entry into school: the beginning school transition and educational stratification in the United States. *Annu. Rev. Sociol.* 19:401–23

Erikson R, Goldthorpe JH. 1992a. *The Constant Flux: A Study of Class Mobility in Industrial Societies*. Oxford: Clarendon

Erikson R, Goldthorpe JH. 1992b. The CASMIN project and the American Dream. *Eur. Sociol. Rev.* 8:283–305

Farkas G, Lang K, England P. 1994. Economic sociology and social economics: Where are we now? In *Industries, Firms, and Jobs: Sociological and Economic Approaches*, ed. G Farkas, P England, pp. xv-xxxiii. New York: Aldine de Gruyter

Friedland R, Robertson AF, eds. 1990. *Beyond the Marketplace: Rethinking Economy and Society*. New York: Aldine de Gruyter

Fukumoto IK, Grusky DB. 1993. Social mobility and class structure in early-industrial France. In *Building European Society: Occupational Change and Social Mobility in Europe, 1840–1940*, ed. A Miles, D Vincent, pp. 40–67. Manchester: Manchester Univ. Press

Ganzeboom HBG, Treiman DJ, Ultee WC. 1991. Comparative intergenerational stratification research: three generations and beyond. *Annu. Rev. Sociol.* 17:277–302

Gartrell CD. 1985. Relational and distributional models of collective justice sentiments. *Soc. Forces* 64:64–83

Gartrell CD. 1987. Network approaches to social evaluation. *Annu. Rev. Sociol.* 13·49–66

Gerlach ML. 1992a. *Alliance Capitalism: The Social Organization of Japanese Business*. Berkeley: Univ. Calif. Press

Gerlach ML. 1992b. The Japanese corporate network: A blockmodel analysis. *Admin. Sci. Q.* 37:105–39

Gerlach ML, Lincoln JR. 1992. The organization of business networks in the United States and Japan. See Nohria & Eccles 1992, pp. 491–520

Gibbons R, Murphy KJ. 1990. Relative performance evaluation for chief executive officers. (Do compensation policies matter?) *Indust. Labor Relat. Rev.* 43:S30–51

Gibbons R, Murphy KJ. 1992. Optimal incentive contracts in the presence of career concerns: theory and evidence. *J. Polit. Econ.* 100:468–505

Goodman LA, Clogg CC. 1992. New methods for the analysis of occupational mobility tables and other kinds of cross-classifications. *Contemp. Sociol.* 21:609–22

Granovetter M. 1985. Economic action and social structure: the problem of embeddedness. *Am. J. Sociol.* 91:481–510

Granovetter M. 1990. The old and the new economic sociology: a history and an agenda. See Friedland & Robertson 1990, pp. 89–112

Granovetter M. 1992a. Economic institutions as social constructions: a framework for analysis. *Acta Sociol.* 35:3–11

Granovetter M. 1992b. Problems of explanation in economic sociology. See Nohria & Eccles 1992, pp. 25–56

Grusky DB. 1994a. The contours of social stratification. See Grusky 1994b, pp. 3–35

Grusky DB, ed. 1994b. *Social Stratification: Class, Race, and Gender in Sociological Perspective*. Boulder, CO: Westview

Gustin BH. 1973. Charisma, recognition, and the motivation of scientists. *Am. J. Sociol.* 78:1119–34

Haller AO. 1982. Reflections on the social psychology of status attainment. In *Social Structure and Behavior: Essays in Honor of William Hamilton Sewell*, ed. RM Hauser, AO Haller, D Mechanic, TS Hauser, pp. 3–28. New York: Academic

Han S-K. 1992. Churning firms in stable markets. *Soc. Sci. Res.* 21:406–18

Han S-K. 1995. Mimetic isomorphism and its effect on the audit services market. *Soc. Forces* 73:637–64

Hannan MT. 1992. Rationality and robustness in multilevel systems. In *Rational Choice Theory: Advocacy and Critique*, ed. JS Coleman, TJ Fararo, pp. 120–36. Newbury Park, CA: Sage

Hannan MT, Carroll GR. 1992. *Dynamics of Organizational Populations: Density, Legitimation, and Competition*. New York: Oxford Univ. Press

Hannan MT, Freeman JH. 1989. *Organizational Ecology*. Cambridge, MA: Harvard Univ. Press

Hartog J, van Ophem H. 1994. On-the-job search and the cyclical sensitivity of job mobility. *Eur. Econ. Rev.* 38:802–8

Haveman HA, Cohen LE. 1994. The ecological dynamics of careers: the impact of organizational founding, dissolution, and merger on job mobility. *Am. J. Sociol.* 100:104–52

Hechter M, Friedman D, Kanazawa S. 1992. The attainment of global order in heterogeneous societies. In *Rational Choice Theory: Advocacy and Critique*, ed. JS Coleman, TJ Fararo, pp. 79–97. Newbury Park, CA: Sage

Hersch J, Davis P. 1994. Job matching and women's wage-tenure profile. *Appl. Econ.* 26 205–15

Hirshleifer J. 1985 The expanding domain of economics. *Am. Econ. Rev.* 85:53–68

Horan PM. 1978. Is status attainment research atheoretical? *Am. Sociol. Rev.* 43:534–41

Hout M. 1989. *Following in Father's Footsteps: Social Mobility in Ireland.* Cambridge, MA: Harvard Univ. Press

Hout M, Hauser RM. 1992. Symmetry and hierarchy in social mobility: a methodological analysis of the CASMIN model of class mobility. *Eur. Sociol. Rev.* 8:239–66

Jasso G. 1980. A new theory of distributive justice. *Am. Sociol. Rev.* 45:3–32

Jencks C. 1990. What is the true rate of social mobility? See Breiger 1990b, pp. 103–30

Jencks C, Perman L, Rainwater L. 1988. What is a good job? A new measure of labor-market success. *Am. J. Sociol.* 93:1322–57

Kalleberg AL, Stark, D. 1993. Career strategies in capitalism and socialism: work values and job rewards in the United States and Hungary. *Soc. Forces* 72:181–98

Kerckhoff AC. 1995. Processes of social mobility in industrial society. *Annu. Rev. Sociol.* 21:In press

Knottnerus JD. 1987. Status attainment research and its image of society. *Am. Sociol. Rev.* 52:113–21

Kurz K, Müller W. 1987. Class mobility in the industrial world. *Annu. Rev. Sociol.* 13:417–42

Leifer EM. 1988. Interaction preludes to role setting: exploratory local action. *Am. Sociol. Rev.* 53:865–78

Leifer EM. 1991. *Actors as Observers: A Theory of Skill in Social Relationships.* New York: Garland

Lin N. 1990. Social resources and social mobility: a structural theory of status attainment. See Breiger 1990b, pp. 247–71

Lin N, Bian Y. 1991. Getting ahead in urban China. *Am. J. Sociol.* 97:657–88

Lin N, Xie W. 1988. Occupational prestige in urban China. *Am. J. Sociol.* 93:793–832

Lincoln JR, Kalleberg AL. 1990. *Culture, Control and Commitment: A Study of Work Organizations and Work Attitudes in the United States and Japan.* Cambridge: Cambridge Univ. Press

Lindenberg S, Frey BS. 1993. Alternatives, frames, and relative prices: a broader view of rational choice theory. *Acta Sociol.* 36: 191–205

Lynd R, Lynd H. 1929. *Middletown.* New York: Harcourt

Marini MM. 1989. Sex differences in earnings in the United States. *Annu. Rev. Sociol.* 15: 343–80

Marsden PV, Campbell KE. 1990. Recruitment and selection processes: the organizational side of job searches. See Breiger 1990b, pp. 59–79

McPherson JM, Popielarz PA, Drobnic S. 1992. Social networks and organizational dynamics. *Am. Sociol. Rev.* 57:153–70

Meyer JW. 1994. The evolution of modern stratification systems. See Grusky 1994b, pp. 730–37

Moen P, Wethington E. 1992. The concept of family adaptive strategies. *Annu. Rev. Sociol.* 18:233–51

Molotch H, Boden D. 1985. Talking social structure: discourse, domination, and the Watergate hearings. *Am. Sociol. Rev.* 50: 273–88

Montgomery JD. 1994. Weak ties, employment, and inequality: an equilibrium analysis. *Am. J. Sociol.* 99:1212–36

Myles J, Turegun A. 1994. Comparative studies in class structure. *Annu. Rev. Sociol.* 20:103–24

Nakao K. 1992. Occupational stratification: issues of measurement. *Contemp. Sociol.* 21: 658–62

Namboodiri K, Corwin RG. 1993. *The Logic and Method of Macrosociology: An Input-Output Approach to Organizational Networks.* Westport, CT: Praeger

Nee V. 1989. A theory of market transition: from redistribution to markets in state socialism. *Am. Sociol. Rev.* 54:663–81

Nee V. 1991. Social inequalities in reforming state socialism: between redistribution and markets in China. *Am. Sociol. Rev.* 56:267–82

Nee V. 1992. Organizational dynamics of market transition: hybrid forms, property rights, and mixed economy in China. *Admin. Sci. Q.* 37:1–27

Nohria N, Eccles RG, eds. 1992. *Networks and Organizations: Structure, Form, and Action.* Boston, MA: Harvard Business School Press

Olzak S. 1992. *The Dynamics of Ethnic Competition and Conflict.* Stanford, CA: Stanford Univ. Press

Olzak S, Shanahan S, West E. 1994. School desegregation, interracial exposure, and antibusing activity in contemporary urban America. *Am. J. Sociol.* 100:196–241

O'Rand AM, Krecker ML. 1990. Concepts of the life cycle: their history, meanings, and uses in the social sciences. *Annu. Rev. Sociol.* 16:241–62

Padgett JF. 1990. Mobility as control: Congressmen through committees. See Breiger 1990b, pp. 27–58

Padgett JF, Ansell CK. 1993. Robust action and the rise of the Medici, 1400–1434. *Am. J. Sociol* 98:1259–319

Pappi FU, Knoke D, Bisson S. 1993. Information exchange in policy networks. See Scharpf 1993, pp. 287–313

Peng Y. 1992. Wage determination in rural and urban China: a comparison of public and private industrial sectors. *Am. Sociol. Rev.* 57:198–213

Petersen T. 1992. Alternative ways of modeling mobility. *Contemp. Sociol.* 21:636–39

Petersen T. 1993. Recent advances in longitudinal methodology. *Annu. Rev. Sociol.* 19: 425–54

Pong S-L. 1993. Preferential policies and secondary school attainment in penninsular Malaysia. *Sociol. Educ.* 66:245–61

Powell WW, DiMaggio PJ, eds. 1991. *The New Institutionalism in Organizational Analysis.* Chicago: Univ. Chicago Press

Raftery AE, Hout M. 1993. Maximally maintained inequality: expansion, reform, and opportunity in Irish education, 1921–75. *Sociol. Educ.* 66:41–62

Reddy W. 1984. *The Rise of Market Culture: The Textile Trade and French Society, 1750–1900.* Cambridge: Cambridge Univ. Press

Reskin B. 1993. Sex segregation in the workplace. *Annu. Rev. Sociol.* 19:241–70

Róna-Tas Á. 1994. The first shall be last? Entrepreneurship and communist cadres in the transition from socialism. *Am. J. Sociol.* 100: 40–69

Rosenbaum JE. 1990. Structural models of organizational careers: a critical review and new directions. See Breiger 1990b, pp. 272–307

Rosenfeld RA. 1992. Job mobility and career processes. *Annu. Rev. Sociol.* 18:39–61

Sabel C. 1991. Moebius-strip organizations and open labor markets: some consequences for the reintegration of conception and execution. In *Social Theory for a Changing Society*, ed. P Bourdieu, JS Coleman, pp. 23–54. Boulder, CO: Westview

Scharpf FW, ed. 1993. *Games in Hieararchies and Networks: Analytical and Empirical Approaches to the Study of Governance Institutions.* Boulder, CO: Westview

Schütz A. 1967. *The Phenomenology of the Social World.* Transl. G Walsh, F Lehnert. Evanston, IL: Northwestern Univ. Press

Sewell WH, Hauser RM. 1992. The influence of *The American Occupational Structure* on the Wisconsin model. *Contemp. Sociol.* 21: 598–603

Skocpol T. 1992. *Protecting Soldiers and Mothers: The Political Origins of Social Policy in the United States.* Cambridge, MA: Harvard Univ. Press

Skocpol T. 1993. Soldiers, workers, and mothers: gendered identities in early U.S. social policy. *Contention* 2:157–83

Sørensen A. 1994. Women, family, and class. *Annu. Rev Sociol* 20:27–47

Sørensen AB. 1986. Theory and methodology in social stratification. In *The Sociology of Structure and Action*, ed. U Himmelstrand, pp. 69–95. Beverly Hills, CA: Sage

Sørensen AB. 1991. On the usefulness of class analysis in research on social mobility and socioeconomic inequality. *Acta Sociol.* 34: 71–87

Stark D. 1989. Bending the bars of the iron cage: bureaucratization and informalization in capitalism and socialism. *Sociol. Forum* 4:637–64

Stark D. 1992a. From system identity to organizational diversity: analyzing social change in East Central Europe. *Contemp. Sociol.* 21: 299–304

Stark D. 1992b. Path dependence and privatization strategies in East Central Europe. *East Eur. Polit. Soc.* 6:17–51

Stark D. 1994. *Recombinant property in East European capitalism.* Work. Pap. Inst. Adv. Study, Collegium Budapest (Hungary)

Strang D, Meyer JW. 1993. Institutional conditions for diffusion. *Theory Soc.* 22:487–511

Sutton JR, Dobbin F, Meyer JW, Scott WR. 1994. The legalization of the workplace. *Am. J. Sociol.* 99:944–71

Treas J. 1987. The effect of women's labor force participation on the distribution of income in the United States. *Annu. Rev. Sociol.* 13:259–88

Treas J. 1993. Money in the bank: transaction costs and the economic organization of marriage. *Am. Sociol. Rev.* 58:723–34

Treiman DJ. 1970. Industrialization and social stratification. In *Social Stratification: Research and Theory for the 1970s*, ed. EO Laumann, pp. 207–34. Indianapolis: Bobbs-Merrill

Treiman DJ, Yip K-B. 1989. Educational and occupational attainment in 21 countries. In *Cross-National Research in Sociology*, ed. ML Kohn, pp. 373–94. Newbury Park, CA: Sage

Wacquant LJD. 1992. Toward a social praxeology: the structure and logic of Bourdieu's sociology. See Bourdieu & Wacquant 1992, pp. 1–59

Warner K, Molotch H. 1993. Information in the marketplace: media explanations of the '87 crash. *Soc. Probl.* 40:167–88

Waters M. 1995. Ethnic inequality in America: current changes and shifts over time. *Annu. Rev. Sociol.* 21:415–46

Wegener B. 1992. Concepts and measurement of prestige. *Annu. Rev. Sociol.* 18:253–80

Western M. 1994. Class structure and intergenerational class mobility: A comparative analysis of nation and gender. *Soc. Forces* 73:101–34

White HC. 1992a. *Identity and Control: A Structural Theory of Social Action.* Princeton, NJ: Princeton Univ. Press

White HC. 1992b. Agency as control in formal networks See Nohria & Eccles 1992, pp. 92–117

White HC. 1993. *Careers and Creativity: Social Forces in the Arts.* Boulder, CO: Westview

White HC, Boorman SA, Breiger RL. 1976. Social structure from multiple networks: I.

Blockmodels of roles and positions. *Am. J. Sociol.* 81:730–80

Wiegand B. 1994. Black money in Belize: the ethnicity and social structure of black-market crime. *Soc. Forces* 73:135–54

Williamson OE. 1991. Comparative economic organization: the analysis of discrete structural alternatives. *Admin. Sci. Q.* 36:269–96

Wilson TP. 1991. Social structure and the sequential organization of interaction. See Boden & Zimmerman 1991, pp. 22–43

Wong RS-K, Hauser RM. 1992. Trends in occupational mobiliy in Hungary under socialism. *Soc. Sci. Res.* 21:419–24

Zukin S, DiMaggio P, eds. 1990. *Structures of Capital: The Social Organization of the Economy*. New York: Cambridge Univ. Press

Annu. Rev. Sociol. 1995. 21:137–62
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CLASS VOTING IN CAPITALIST DEMOCRACIES SINCE WORLD WAR II:

Dealignment, Realignment, or Trendless Fluctuation?

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ABSTRACT

Over the last two decades, many social scientists have argued that the stable class politics of industrial capitalism is giving way to newer types of social and attitudinal cleavages. Some scholars have gone further to associate what they see as significant declines in the anchorings provided by class with the rise of new political movements, parties, and even politicians standing for office completely outside traditional party systems. Advances in class theory and statistical methods coupled with the availability of high quality data have led others to reexamine the issue. They have suggested that these arguments reflect a misreading of the empirical evidence and/or exaggerate the significance of these developments. We conclude that despite the absence of a clear consensus in the field, theories asserting a universal process of class dealignment are not supported.

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INTRODUCTION

The sociological study of politics centers on two broad concerns: the relationship among social structures, social action, and political institutions (or more generally the interaction between "states" and "societies"), and the social bases of individuals' political behavior. The seminal postwar work in political sociology, Seymour Martin Lipset's *Political Man* (1960), for example, explicitly developed analyses in both of these areas. In recent years, however, the state tradition has become the predominant focus of political sociology (Alford & Friedland 1985, Barrow 1993, Haynes & Jacobs 1994: 71). This review considers the more neglected side of the classical tradition: the relationship between social divisions and political behavior, specifically the relationship between class and voting in the capitalist democracies of Western Europe, North America, and Australia.

The status of the "democratic class struggle" (Anderson & Davidson 1943, Lipset 1981 [1960], Korpi 1983, Esping-Anderson 1994) has been the subject of vigorous recent scholarly debates. A number of analysts have suggested that the stable class politics of industrial capitalism is giving way to newer cleavages based on gender, identity, and values. Some scholars have gone further to argue that class dealignment, along with declining political salience of other social cleavages, is leading to increased political instability in the form of new political movements, new parties, and even politicians standing for office completely outside traditional party systems. Others have countered that conclusions of class "dealignment" are a misreading of the empirical evidence and/or an exaggeration of the significance of these developments. Instead of class dealignment, defenders of class analysis argue that the class/vote association is merely subject to patterns of "trendless fluctuation" or, in exceptional cases, class "realignment." Our task is to review and evaluate these debates and the evidence.

We begin our review with an overview of the early scholarship on class voting. In part two, we consider the evidence for the declining significance of class for electoral politics. Part three examines research that challenges these findings, insisting on the continuing significance of class. In both of these sections, we discuss and evaluate both theoretical and empirical studies based on single-nation or cross-national comparisons, although to keep the discussion manageable we limit ourselves to the English language literature. In part four we address the methodological issues—including how to define class—that partly frame the debate. Last, we review analyses of the class basis of nonvoting, an important topic for class politics but one often isolated from the analysis of vote choice.

We note at the outset that our discussion of the literatures on class and voting addresses two related topics that have each been the subject of heated debates.

First, there are controversies over the proper way of measuring the level of class voting and in particular of assessing the presence or absence of trends in the association between class and voting. A variety of statistical approaches have been developed to assess trends in class voting, and these often produce different estimates of the magnitude and changes over time in class-vote association (Goldthorpe 1994, Weakliem 1995). Second, there are controversies over the proper interpretation of the observed trends (or nontrends). Researchers have offered different kinds of institutional, historical, and cultural analyses to account for empirical findings.

SCHOLARLY ROOTS OF CONTEMPORARY DEBATES

The nineteenth century socialist movements and parties spawned an enduring interest in the association between class and voting (Przeworski 1980, Przeworski & Sprague 1986). Marx argued that the industrial working class would form the backbone of the revolutionary transformation of capitalism. Many socialists and social democratic leaders later assumed, and their conservative opponents feared, that if workers won the franchise, they could lay the foundation for an electoral road to socialism. By 1895, Engels' infamous "Introduction" to Marx's *The Class Struggles in France, 1848–1850* could hail the steady progress made by social democratic parties in Western Europe and suggest that the socialist revolution could be brought about through the ballot box by workers voting for socialist parties (Engels 1978 [1895]).

The social scientific study of class voting is usually motivated by an interest in testing the assumption of a direct link between class and electoral behavior as posited by theorists and opponents of social democracy. Early attempts to study the class-vote link used ecological techniques to infer the voting preferences of different income groups (Siegfried 1913, Ogburn & Hill 1935, Ogburn & Coombs 1940). Anderson & Davidson (1943) used Northern California precinct registration data to analyze how occupation affected political preference and changes in party identification during the New Deal period. The advent of election surveys, however, made possible more direct testing of the class-vote link. Lazarsfeld and his colleagues at the Bureau of Applied Social Research at Columbia made landmark contributions in the 1940s (Lazarsfeld et al 1948, Berelson et al 1954). They compiled evidence of a social basis for political behavior in election surveys in Erie County, Ohio (1940) and Elmira, New York (1948). More influential still were the empirical findings and theories developed by the "Michigan School" (especially Campbell et al 1960). The American National Election Study (ANES) has been carried out biannually in the United States since 1948, and similar national surveys based on the Michigan model have been periodically carried out in virtually every western democracy since the 1960s.

The seminal postwar voting research studies offered three distinct hypotheses about the association between an individual's class location and partisan preference, hypotheses that have continued to inform contemporary research. The simplest model emphasized material interests as the foundation for class voting. For example, Lipset and his colleagues argued in 1954 that class voting is a matter of "...simple self-interest. The leftist parties represent themselves as instruments of social change in the direction of equality; the lower-income groups will support them in order to become economically better off, whereas the higher-income groups will oppose them in order to maintain their economic advantages" (Lipset et al 1954:1136; also Downs 1957: Ch. 3). The assumption that material class interests provide the foundation for class voting has remained the standard explanation shared by virtually all analysts to some degree or another (Evans 1993:263). But the empirical fact that many members of a particular class do not vote according to narrow class interests (for example, Heath et al 1991:68–69 note that members of a class rarely provide more than 60% of their votes to their natural class party), however, suggests that further theorization of the mechanisms linking class membership and voting are needed (Lipset et al 1954:1136, Scarbrough 1987, Weakliem & Heath 1994a).

The "Columbia School" (Lazarsfeld et al 1948, Berelson et al 1954) provided an explanation for voters' decision-making that went beyond the simple invocation of interests. The core of their findings was the discovery of very high levels of stable partisanship on the part of voters, and that voters susceptible to changing their votes in the context of the campaign were those least interested in politics (Lazarsfeld et al 1948:69). They explained this seeming anomaly by emphasizing the importance of the cumulative effects of the historical experiences of social groups and the reinforcing effects of relatively homogenous social networks (Lazarsfeld et al 1948:137–149, Berelson et al 1954:88–109). Class voting in this model reflects the strength of common experiences of key historical moments and the reinforcing effects of intra-class friendship networks and social organizations (see also Frankel 1991 and Weakliem & Heath 1994a for recent applications).

The most influential of the postwar approaches to understanding political behavior was that of the Michigan School, in particular the analysis developed in *The American Voter* (Campbell et al 1960). The Michigan School viewed the mechanisms of voting as occupying positions along a funnel that represented both a causal and a temporal ordering (Campbell et al 1960:24–25). Social structural variables, including class origins and occupation, were seen as operating at the mouth of the funnel, leading to the social-psychological attributes (primarily political attitudes and partisan identification) at the narrow end of the funnel that ultimately predicted vote choice. Emphasizing a lack of ideological awareness and political sophistication on the part of most Americans (Converse 1964), the Michigan School viewed class voting as requiring a level of political sophistication unavailable to a significant portion of the electorate. Voters who were aware of their class location and who could make active use of class voting heuristics were much more likely to cast a vote consistent with their class (Campbell et al 1960: Ch. 13).

The accumulation of national election surveys since the 1960s has permitted detailed examination of theses about the association of class voting over extended time periods. Through the early 1970s, most findings suggested that class had a strong—though variable—influence on voting behavior (Lipset 1981 [1960], Alford 1963, Lipset & Rokkan 1967a, Rose 1974a). Lipset & Rokkan's influential theoretical synthesis (1967b) argued that two revolutions, the national revolution and the industrial revolution, initiated everywhere processes of social differentiation and conflict. The two revolutions produced four basic sets of cleavages: 1) church(es) vs the state; 2) dominant vs subject cultures; 3) primary vs secondary economy; and 4) employers vs workers (1967b: 14). The precise political articulation of these cleavages varied from country to country, depending on geopolitical structures and the timing of political and economic development, but all countries were subject to the same basic pattern. Further industrialization led to the decline of most types of social cleavage other than class, magnifying the importance of the democratic class struggle and "freezing" the cleavage structure (Lipset & Rokkan 1967b; see also Rose & Urwin 1970, Bartolini & Mair 1990).

THE DECLINING SIGNIFICANCE OF CLASS?

A series of setbacks experienced by social democratic or working-class parties, the emergence of religious, nativist, and regionalist political movements (cleavages long thought to have been depoliticized), and the sudden appearance of "new" issues such as ecological and antinuclear concerns have given rise to a wide range of challenges to class-based models of politics. A variety of labels have been offered to characterize this new environment: Scholars have variously claimed to find evidence of the "declining political significance of class" (Clark et al 1993), a "loosening of social structure" (Burler & Kavanaugh 1984:8), an "opening up" of the electorate (Rose & McAllister 1986), the emergence (especially among younger cohorts) of a "new politics" or "postmaterialist" orientations (Ingelhart 1977, 1990, Baker et al 1981, Dalton 1988), a general process of "dealignment" (Sarlvik & Crewe 1983, Nie et al 1981), or "the decline of cleavage politics" (Franklin et al 1992a). In this section we review the empirical foundations of the hypothesized declining significance of class and the attempts to explain it.

Empirical Evidence of Declining Class Voting

Figure 1 replicates a graph that has been presented—with only minor variations—in numerous publications as evidence of the decline of class voting

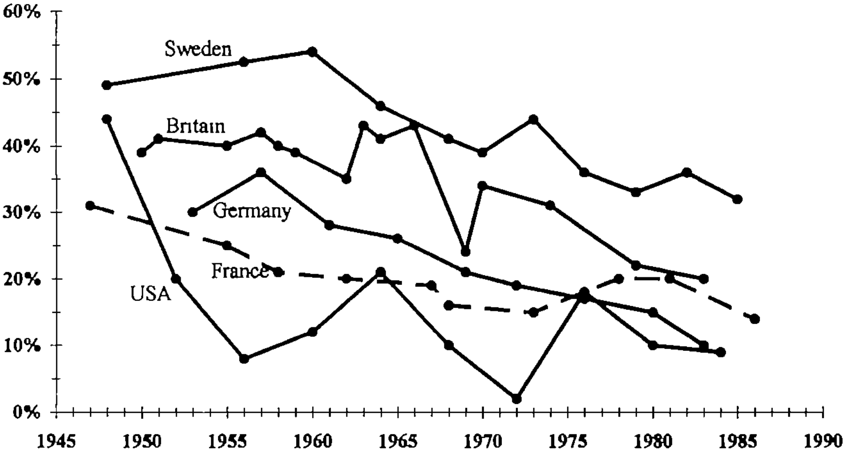

Figure 1 Alford Index of class voting shows decline over time. (Source: Clark et al 1993, Figure 3)

(e.g. Lipset 1981:505, Inglehart 1984:30, Dalton 1988:157, Huckfeldt & Kohfeld 1989:3, Minkenberg & Inglehart 1989:85, Clark & Lipset 1991:403, Piven 1992a:7, Clark et al 1993:312). The graph is based on an extension of Alford's (1963, 1967) deceptively simple index of class voting, first introduced in the 1960s. The "Alford index," as it has come to be known, measures class voting as the percentage of "persons in manual occupations voting for Left parties" minus "the percentage of persons in nonmanual occupations voting for Left parties" (Alford 1963:79–80). The figure suggests that in many different countries support for left parties by manual workers has declined while employers and nonmanual employees' support for those same parties has increased. (We analyze the statistical properties of the Alford index, and the other measures considered in this and the next section of the paper in the methodological section below).

A second, related type of empirical evidence offered to support the declining significance of class thesis considers levels of "absolute" class voting, defined by Crewe (1986:620) as (referring to Britain) "middle-class Conservative plus working class Labour [votes] as a proportion of the total votes" cast (also Dunleavy 1987, Rose & McAllister 1986). The intuition behind the absolute class voting measure is that each voter has a natural class party (left parties for manual workers and right parties for nonmanual workers in the two class model); if the proportion of voters choosing their natural class party falls, the levels of class voting can be said to have declined (Weakliem 1995). A number of analysts have used absolute measures of class voting to demonstrate declining class voting (Sarlvik & Crewe 1983, Crewe 1986, Rose & McAllister 1986).

Both the Alford and absolute class voting approaches generally consider only the gross effects of class on vote choice (except Rose & McAllister 1986). A number of scholars have used multivariate models to test for change in the relative net predictive power of class in comparison with other significant social structural variables (Franklin 1985, Franklin et al [1992b] contains multivariate regression analyses from 15 countries). These results tend to vary widely from country to country, and to a lesser extent from election to election within a given country. Nevertheless, in many countries scholars have claimed to find that regression results show that class explains a reduced proportion of the variance in recent elections and hence has declined in importance for political behavior (especially the studies in Franklin et al 1992b).

Explanations of the Decline of Class Voting

Empirical evidence of the declining significance of class voting has given rise to a wide range of theoretical explanations. Many general sociological arguments assert the decline of class per se. Social scientists from virtually all points along the political spectrum (to cite but a few, Hobsbawm 1981, Gorz 1982, Baumann 1982, Laclau & Mouffe 1985, Sorensen 1991, Clark & Lipset 1991) have heralded (in one way or another) the withering away of class. Here we consider only those arguments that have been explicitly linked to electoral politics. At least five distinct theories have been offered: 1) working class "embourgeoisement" and social mobility explanations; 2) the emergence of new forms of social division replacing "class" as a source of political cleavage; 3) "cognitive mobilization" approaches; 4) value change approaches emphasizing the emergence of a "second" left; and 5) macrolevel approaches, which focus on party strategies and changing structures of global capitalism.

EMBOURGEOISEMENT/SOCIAL MOBILITY APPROACHES Various explanations for the decline of electoral differentiation on the basis of class emphasize either the growing affluence or "embourgeoisement" of the working class and lower-level white collar workers (Halle & Romo 1991). Although not in wide use today, they nevertheless still provide a key standpoint in the debates over class politics. [Sainsbury (1985) provides a critical review of working class affluence theories of changing vote patterns in the Scandanavian countries.] Related arguments emphasize the importance of occupational and social mobility for declining class voting, seeking to assess the impact of individual mobility experiences on political behavior. Most of these studies have found that the mobile are likely to adopt a middle standpoint between their class of origin and class of destination (Turner 1992, Weakliem 1992; De Graaf et al 1995 argue for an "acculturation" model in which the mobile gradually adopt the political norms of the class of destination). The significantly greater levels of class mobility in the postwar period (Erikson & Goldthorpe 1992), resulting largely from the steady and nearly universal growth of professional and managerial employment (Esping-Anderson 1994, Brint 1994), suggest that mobility may be constraining class voting.

NEW SOCIAL DIVISIONS A second set of explanations for the decline of class voting emphasizes the increased importance of cross-cutting, nonclass forms of social cleavage in the politics of postindustrial capitalist democracies. A wide range of theories of working class fragmentation exist in the literature (e.g. the studies in Piven 1992b). Other new or reemerging cleavages are based on ascribed characteristics such as gender, race, ethnicity, or linguistic differences, as the "identity" struggles of social groups such as movements of gays and lesbians, regional movements, and others (Laclau & Mouffe 1985). Many of these divisions have long historical roots that can be traced back to earlier political divisions which have often been dormant throughout the twentieth century. The profusion of new axes of conflict suggests to some that a focus on class per se is mistaken (Balbus 1982, Cohen 1982). Much of this literature has not attempted to test these propositions systematically with election data. An important exception to this generalization can be found in a series of arguments that a "consumption cleavage" increasingly divides British voters, cutting across the standard class divisions by dividing those relying on the public sector for housing and income from those dependent on the market (Dunleavy 1980, Duke & Edgell 1984, Taylor-Gooby 1986).

POLITICAL LEARNING APPROACHES A third set of arguments explains the decline of class in terms of the increased capacity of a better-educated citizenry to make political decisions independent of the constraints of class loyalty or other social attributes (Dalton et al 1984, Rose & McAllister 1986, Dalton 1988, Inglehart 1990: Ch. 10, Franklin et al 1992a,b). Voters are viewed as increasingly capable of rational assessment of party and candidate platforms (Nie et al 1981) and therefore less likely to rely on simple class-based heuristics (Rose & McAllister 1986). Inglehart (1977, 1990) described this process as one of "cognitive mobilization," while other scholars have characterized it as the emergence of "open" electoral competition (Rose & McAllister 1986).

As Weakliem (1995) has noted, the political learning thesis distinguishes between voters shaped primarily by class (whom Weakliem characterizes as "class loyalists") versus voters who make electoral choices independent of class influences. The most sophisticated attempts to defend this thesis typically assert that increased voter rationality can be traced either to rising "issue voting" (e.g. Sarlvik & Crewe 1983, Franklin 1985, Shanks & Miller 1990) or to retrospective or prospective assessments of party performance (Tufte

1978, Kinder & Kiewiet 1981, Hibbs 1987, Achen 1992, Haynes & Johnson 1994). Political learning approaches often link the increased capacities of voters to make independent electoral choices to class dealignment (e.g. Franklin 1985, Rose & McAllister 1986), although the directionality of the relationship between issue voting and class dealignment often appears circular (Scarbrough 1987:222).

POSTMATERIALISM AND THE TWO LEFTS? Perhaps the most influential of the microlevel explanations for the decline of class voting emphasizes the importance of value change and the rise of new attitudinal cleavages. In particular, a large literature has developed around the claim that the historical links between workers and parties of the left have weakened at the same time that a "second" left rooted in segments of the middle class has grown up (Parkin 1968, Lipset 1981:503–23, Offe 1985). This is said to have produced a global trend toward declining class voting for two principal reasons. First, the increased proportions of left party support drawn from middle class sectors have weakened the class coherence of party platforms as "new" issues such as concerns about environmental protection, peace, civil rights for previously ignored groups such as women and gays and lesbians, and more generally quality-of-life issues have arisen (Offe 1985, Inglehart & Rabier 1986). Second, as left parties have altered their appeals to become more inclusive, their appeal to workers concerned with "material" issues has weakened (Przeworski & Sprague 1986).

The oldest source of the "two lefts" argument is a theoretical tradition that seeks to understand the anomaly of support for socialism among middle class intellectuals. Starting from the observation that virtually every socialist and revolutionary party (even in the third world) was founded and led not by workers but middle class intellectuals, these "new class" theories argue that intellectuals are often drawn to nonmarket forms of rationality critical of capitalist society (Gouldner 1979, Eyerman et al 1987), which may ultimately take the form of support for left parties (Alt & Turner 1982, Inglehart 1990, Nieuwbeerta et al 1992). The new class position (and related arguments) does not, however, emphasize the decline of class per se, as the material interests of middle class segments provide the key explanatory mechanism (Brym et al 1989). These arguments may suggest the possibility of class realignment, not dealignment (Hout et al 1994).

The most systematic effort to account for middle class leftism, which clearly does break with class-centered accounts, has grown out of Inglehart's (1977, 1990) "postmaterialist" thesis. In a series of articles and books based on cross-national surveys fielded in ten or more countries in every year since 1973, Inglehart and his colleagues (especially Abramson & Inglehart 1992, Dalton 1988, Inglehart 1977, 1990, Inglehart & Abramson 1994) have set forth an ambitious attempt to explain contemporary patterns of political change.

Inglehart argues that a systematic shift has taken place in values on the part of younger cohorts born into relative affluence during the post-World War II period. These younger cohorts are said to be increasingly concerned with "postmaterialist" priorities while rejecting the "materialist" concerns of earlier cohorts born in a less affluent period. A process of generational replacement is thus occurring in which postmaterialists are gradually becoming the dominant segment of the population in postindustrial societies (Abramson & Inglehart 1992, Inglehart & Abramson 1994), leading to (among other things) a decline in class voting (Inglehart 1984, Inglehart & Rabier 1986; see also Flanagan & Dalton 1984).

MACROLEVEL FORCES The literature considered thus far offers theories of *voters,* not *voting.* The decline in class voting has been explained primarily in terms of changes in voters' attitudes and aptitudes. Macro-structural analyses of party strategies and macroeconomic environment provide a very different impression of the sources of change in the class-vote alignment. Two distinct approaches can be identified: analyses of the "dilemma of electoral socialism," and analyses of the consequences of global economic changes on party strategies and voter coalitions.

The analysis of the history of social democratic parties developed by Przeworski (1980) and Przeworski & Sprague (1986) asserts that parties cannot successfully appeal to all groups, and that they therefore face an electoral trade-off in appealing to different groups of voters. Left parties whose core constituencies are manual workers face an electoral dilemma: Since the working class (defined narrowly by Przeworski & Sprague) are always an electoral minority, left parties must appeal to middle class voters as well if they are to win elections. Yet such strategically necessary maneuvers have important class demobilizing consequences: "whenever leftist parties are successful in mobilizing large electoral support from anyone else they suffer a loss of opportunities among narrowly defined workers" (Przeworski & Sprague 1986:60). This trade-off occurs, according to Przeworski (1980:43), because left parties "must promise to struggle not for objectives specific to workers as a collectivity—those that constitute the public goods for workers as a class—but only those which workers share as individuals with members of other classes." The electoral dilemma thus undermines class voting in two ways. First, it forces parties originally based in the working class to appeal to members of other classes. To the extent they succeed, class-based electoral cleavages decline. Second, it discourages class-based appeals in politics in general in favor of supra-class themes such as appeals to more general themes of consumers, families, economic prosperity or the nation (also Sainsbury 1990:31).

A second set of macrostructural arguments emphasizes the importance of recent changes in the organization of global capitalism in undermining the prospects for class solidarity and stable class-based electoral alignments (Lash & Urry 1987, Piven 1992b). The rapidity of economic shifts, both between and within sectors, is creating new sets of cross-cutting cleavages that weaken the salience of traditional class divisions. The threat of foreign competition—common to labor and capital—may in some circumstances forge a unity of interests among classes in declining industries and communities (Logan & Molotch 1987). Others have noted that the structural foundations of social democratic hegemony in the working class are being undermined by the penetration of competitive market forces, leading to new sources of fragmentation (Offe 1992).

THE CONTINUING SIGNIFICANCE OF CLASS?

While many scholars have raised serious questions about whether class is "dying" (Clark & Lipset 1991), at least with respect to voting and political behavior, others have challenged these conclusions. In this section we begin by considering the empirical evidence that has been offered to demonstrate the continuing significance of the class thesis; then we turn to explanations of recent political change.

Empirical Evidence of the Continuing Significance of Class

Clark & Lipset (1991:403) assert that class voting as measured by the Alford Index "has declined in every country for which data are available." "Continuing" class analysts argue against claims of universal decline, noting wide variation from country to country (Esping-Anderson 1994) and challenge exaggerated claims of electoral instability (Bartolini & Mair 1990). The 15 case studies contained in Franklin et al (1992b)—a volume aiming specifically to demonstrate the decline of social cleavages—vary widely in their estimates of the level and trend in class effects on voting. The loglinear models developed by Nieuwbeerta & De Graaf (1994) to test for the existence of trends in class voting in 16 capitalist democracies established declines for only 6 countries, although the trend parameters were negative in 12 countries (see also Nieuwbeerta 1994). Weakliem & Heath's (1994b) comparative analysis of class voting in Britain, France, and the United States since the 1930s revealed sharply different patterns in the three countries, with France showing no trend over the course of the time series, Britain an increase followed by a decline, and the United States a slow but steady decline. The absence of a universal pattern of decline found in cross-national research suggests the need for more attention to the particular institutional configurations and polities of individual countries, a point central to Lipset's earlier work on class politics (e.g. Lipset 1981 [1960], 1985).

"Continuing" class analysts focusing on individual countries have also challenged the empirical evidence used to demonstrate declining class voting. The Alford index has been challenged on grounds that its two-class scheme and dichotomization of the dependent voting variable lead to misleading results (Korpi 1972, Myles 1979, Heath et al 1985, Hout et al 1994, but see Kelley & McAllister 1985). Expansion of the class scheme to include a more fine-grained set of distinctions than the manual/nonmanual permits alone appears to explain most of the alleged decline of class voting in the United States (Hout et al 1994). More careful specification of the alignments between class, region, and party in Canada corrects the extremely low level of class voting suggested by Alford index approaches (e.g. Alford 1963, Meisel 1975) and suggests that Canadian class voting levels are closer to those of other capitalist democracies (Ogmundson 1975, Myles 1979, Zipp & Smith 1982, Brym et al 1989).

Class analysts have also empirically challenged the argument that the proportion of the electorate voting along class lines has declined. In their important analyses of class voting in Britain, Heath et al (1985: Ch. 3, 1987, 1991: Ch. 5; Evans et al 1991) use a five-class model based on the Goldthorpe class schema (1987; Erikson & Goldthorpe 1992) and loglinear statistical models to test for changes in the association between class and voting (further discussion of their methodological innovations is provided in the next section). Analyzing the log-odds ratios of the different classes supporting the major parties since 1964, they show that a pattern of "trendless fluctuation," not decline, best captures the association between class and voting during this period. Their findings have been confirmed by other analysts using similar class schemes and statistical techniques (Marshall et al 1988: Ch. 9; Weakliem 1989, 1995; Goldthorpe 1994).

Explanations for the Continuing Significance of Class

Much of the argument that class retains its importance for electoral politics rests on the empirical evidence. However, continuing class analysts have also responded to the various interpretative arguments put forward to explain trends in the class/vote link, offering interpretations significantly different than those typically found in the declining significance of class theories. To maintain the flow of the argument, we examine in order the responses of class analysts to each of the five arguments outlined above.

EMBOURGEOISEMENT/MOBILITY ARGUMENTS Claims about the political importance of rising affluence have been tested in many contexts and found wanting (e.g. Goldthorpe et al 1968, Hamilton 1967, 1972). Similarly, the effects of social mobility have always been much weaker than hypothesized in the classical mobility literature (Turner 1992). Class analysts do recognize the importance of collective mobility, in particular the decline of the manual working class and other changes in class structures of postindustrial societies. For example, Heath et al (1985, 1991) explain a significant portion of the poor electoral results of the Labour Party in Britain as reflecting a substantial decline in the size of the manual working class in recent decades. Nevertheless, class analysts argue that claims of class dealignment per se can only be evaluated by examining the relative voting patterns within each class, not the size of the classes themselves (Goldthorpe & Marshall 1992:391).

NEW SOCIAL DIVISIONS AND CLASS POLITICS While acknowledging the force of nonclass cleavages on political attitudes (and to a lesser extent, political partisanship), analysts who continue to emphasize the importance of class argue that nonclass cleavages have always existed in capitalist societies and that there is little evidence yet that new cleavages are emerging that are actually bringing about class dealignment, especially with respect to partisanship. The two most systematic attempts to demonstrate the electoral dealigning effects of an emergent social division are the "consumption cleavage" (as discussed above) and, in the American case, the class/race trade-off (Huckfeldt & Kohfeld 1989, Edsall & Edsall 1991). Reanalysis of voting data from Britain has shown that the consumption cleavage has virtually no effect on vote choice once the model is properly specified (Franklin & Page 1984, Heath et al 1985, 1991, Rose & McAllister 1986; but see Taylor-Gooby 1986). Hout et al (1994) reexamine trends in class voting in the United States, showing that the hypothesized class/race trade-off is not reducing the overall effect of class, as decreases in Northern white working class support for the Democrats appears to be offset by a falling regional effect as the American South behaves more like the rest of the country.

POLITICAL LEARNING Claims about the rising importance of issue and ideological voting have been widely debated in political science in recent years, and no consensus has emerged that cognitive mobilization lies behind recent political change (e.g. Scarbrough 1987, Smith 1989). The relevant claim for our purposes, namely, that increasing issue and ideological voting is linked to declining class voting, has recently been examined in Weakliem's (1995) important study. He systematically tests, for the first time, loglinear models of voting, asserting that declining class voting is associated with a rise in the number of "independent" voters, but finding that the fit of "association" models that place all voters on the same continuum is significantly better than the absolute class voting models. Before any firm conclusions can be drawn, however, further work along these lines is needed, both in other national contexts, in cross-national comparisons, and with more refined class schemes.

VALUE AND CHANGE AND THE "TWO LEFTS" The postmaterialist/two lefts thesis has been one of the most widely debated theoretical approaches to political change in recent years (e.g. Hamilton & Wright 1986, Weakliem 1991, Brooks & Manza 1994). Criticisms of the thesis have raised questions about both the foundations of the theory and its ability to explain voting patterns. Brooks & Manza (1994) develop a foundational critique. They challenge the four-item battery used by Inglehart and test his notion that postmaterialist values constitute a unique dimension of values capable of informing political action. They find that using more sophisticated techniques of measuring values and log-linear statistical techniques showed no evidence that postmaterialist values are distinct from materialist values. Weakliem (1991) considers the ability of the postmaterialist/two lefts thesis to explain party choice in France, the Netherlands, and Italy. While finding some support for Inglehart's claim that postmaterialist values are informing political attitudes, he found that, while all segments of the population are moving in a postmaterialist direction, class differences across cohorts are equally large.

MACROLEVEL ANALYSES The argument that left parties are unable to appeal successfully both to important segments of the working class and to middle class voters has also been challenged. Votes received by left-wing parties in the 1980s in Western Europe, for example, were not appreciably different than their levels of support in earlier periods (e.g. Pulzer 1987, Pierson 1991: Ch. 5). Sainsbury (1990) shows that there is little if any evidence that Scandinavian socialist parties lose working-class votes when they adopt strategies to gain middle class support. She also notes that Przeworski & Sprague's (1986) reliance on official data sources to extrapolate the "carrying capacity" of various socialist parties leads to a severe overestimation of their electoral dilemma.

Similarly, arguments that global economic change are undermining the possibilities of class-based political cleavages have been challenged on several grounds. Hibbs (1982) finds significant class differences in political responses to economic problems. The lack of evidence of clear declines in the level of class voting in more than a handful of countries to date further suggests that theorists of postindustrial politics may have jumped to unwarranted conclusions about the changes that have taken place thus far. The continuing or even growing economic inequalities that have accompanied many of the most important economic shifts in postindustrial capitalism (e.g. Smeeding 1991), declining rates of relative social mobility (e.g. Hout 1988), and increasing poverty (e.g. Markland 1990) suggest that future polarization along class lines may be more, rather than less, likely (Evans 1993, Hout et al 1993).

METHODOLOGICAL ISSUES

In this section we turn to an examination of methodological issues in the study of class voting. First, we examine some of the important definitional questions all class analysts of politics face. We then examine the types of statistical models used in class voting research.

Defining Classes and Political Outcomes

Researchers' decisions about how to define the two key concepts—class and electoral outcome—and how to measure the association between them influence the outcome of their studies.

DEFINING CLASSES Class definitions almost always start with some notion of middle class and working class. Many stop right there. Using occupation or income, they divide the electorate into two groups that might be contrasted. The developments in class theory—both neo-Marxist (Wright 1978, 1985) and neo-Weberian (Erikson et al [EGP] 1979, Marshall et al 1988, Erikson & Goldthorpe 1992)—spawned more differentiated class maps for use in stratification research by the late 1970s and early 1980s. Both share an emphasis on the causal primacy of the source of income rather than the amount of income (Hout et al 1993). The neo-Weberian schema soon made its way into voting studies (Heath et al 1985); studies with differentiated Marxist class schema have been slower in coming. The variant of EGP used by Heath et al (1985) specifies five classes based on distinctions between the self-employed and employees, between nonmanual and manual employees, and between upper and lower categories within the nonmanual and manual classes. Hout et al (1994) further distinguish between professionals and managers among the upper nonmanual employees.

DEFINING POLITICAL OUTCOMES Definitions of electoral outcomes usually start with a left-right dichotomy that parallels the working class–middle class dichotomy. Multiparty systems are frequently forced into this framework (e.g. Nieuwbeerta & De Graaf 1994), although there are exceptions (e.g. Goldthorpe 1994, Ringdal & Hines 1994). A few studies include nonvoting as an additional electoral outcome (e.g. Weakliem & Heath 1994b, Hout 1994) although most studies of nonvoting focus on voter turn-out exclusively (see next section).

LINKING CLASSES AND PARTIES Most class voting studies start with the assumption that workers' interests lead them to vote for parties of the left, and the interests of the middle classes lead them to vote for parties of the right. Any deviations from this assumed link between class and party constitutes evidence of lower overall levels of class voting. This traditional perspective plays down the mediating role of political parties in shaping the conditions under which voters make choices (Kelley et al 1985). However, parties often organize the political articulation of class interests (Przeworski & Sprague 1986). For example, when the US Republican Party makes explicit appeals to workers—as it often has since 1972—or when the Democratic Party seeks to represent the "middle class"—as it has in recent elections (e.g. Edsall 1984, Shanks & Miller 1993)—the a priori assumptions of researchers as to what constitutes class voting may be overthrown even if the intrinsic importance of class divisions for electoral politics remains unchanged. A full understanding of the significance of class divisions for political outcomes requires considerations of class differences in voting, irrespective of which party a particular class lines up with. Hout et al (1994) term this unconstrained association between class and voting outcome "total class voting" and propose that analysts distinguish between "total" and "traditional" class voting.

Goldthorpe (1994) also addresses the issue of traditional class voting. His "topological" model constrains the statistical analysis to admit only traditional class alliances into the calculation of the effect of class on voting outcome. His model also introduces a distinction between positive and negative class voting. In Britain, workers exercise positive class voting by voting for Labour and negative class voting by voting against the Conservative Party. In his analysis of British elections from 1964 to 1992, Goldthorpe finds that negative class voting fluctuates more than positive class voting. In particular, Conservative successes are frequently tied to their "national party" appeals that lower the propensity of workers (including routine white collar and elite blue collar workers) to vote against them.

Statistical Indices and Models

Statistical practices mirror the definitions of classes and parties. Dichotomous approaches generally employ simple indices of absolute or relative class voting. Researchers using more differentiated schemes of class and electoral outcome use multivariate statistical procedures to accommodate the added complexity of their measures.

THE ALFORD INDEX This index—in spite of the criticisms discussed above—remains the empirical starting point for most studies of class voting. Simplicity is at once the biggest asset and a serious limitation of the Alford index. Like any calculation that is not based on the odds-ratio, it confounds differences in the marginal distributions of the variables with differences in the association it hopes to measure (Goodman 1965, Heath et al 1987). As a measure of political change over time, it may be contaminated by shifts in class structures or the overall popularity of political parties (Heath et al 1985) or by the emergence of new parties (Esping-Anderson 1994). The Alford index as a measure of class voting also precludes considering the influence of nonvoting on the overall association between class and voting outcomes.

The pointed statistical criticisms of the Alford index probably overstate its limitations as a measure of relative class voting. If the goal is to measure the effect of class on voting, then the requirement that both be dichotomized is a far more important limitation of the Alford index than its undesirable statistical properties as a measure of association between dichotomies (Hout et al 1994). Odds-ratios (and statistics based on them) and the Alford index give virtually identical results as long as the smaller class and smaller party each comprises between 30% and 49% of the population (Knoke & Hout 1976). In every study we have seen, the observed range of class distributions and electoral outcomes falls within this comfort zone.

ABSOLUTE CLASS VOTING MEASURES Another approach to measuring the class/vote association is to consider the so-called "absolute" level of class voting, as described above. The absolute measure of class voting is susceptible to some of the same problems that afflict the Alford index. Specifically, this approach—like the Alford index—does not control for variability in the marginal distributions of the class and vote outcome variables (Marshall et al 1988:231–32). A more serious problem is that the absolute index combines shifts in party popularity that reflect opinion in all classes with shifts in party popularity within classes. Therefore, it cannot distinguish declines in overall support for left parties from declining working-class support for the left. It may incorrectly infer a drop in the effect of class on voting from generally falling fortunes of the left or right (Heath et al 1987). Proponents' protests notwithstanding (Crewe 1986), this is a serious shortcoming. Scholars using absolute measures assert their interest in endogenous change in the fortunes of left parties precipitated by falling class voting, but their simple index is not the appropriate operationalization of their ideas (Weakliem 1995). Furthermore, the absolute measure is (by definition) susceptible to computational shifts, e.g. for any fixed value of the log-odds ratio, the absolute measure varies over a 20 percentage point range.

MULTIVARIATE MODELS BASED ON THE ODDS-RATIO Since the late 1980s, nearly all research on class voting employs some version of statistical modeling for qualitative dependent variables based on the odds-ratio—loglinear models, logistic regression—or related methods (e.g. probit models). The principal advantages of these approaches are (a) they do not confound changes in marginal distributions (changes in the overall popularity of parties and the distribution of voters among different classes); (b) they can accommodate more than two voting outcomes and more than two classes; and (c) as multivariate methods, they can be used to estimate the effects of class on political outcomes net of the influences of other variables (Heath et al 1985, Hout et al 1994).

The most important features of the various modeling approaches can be seen as properties of a multinomial logistic regression (MLR) model. In its most general form, the MLR model is written for more than two election outcomes, more than two classes and more than two elections. Under this framework, researchers can pool data across all elections by entering election year into the analysis as another independent variable. By selectively using interaction terms, most importantly the three-way interaction of time and class with vote, researchers are able with this approach to compare the effects of class over time without the undue complexity of generating separate equations for each election.

The general form of the MLR model is:

$$\hat{y}_{ij} = \alpha_{0j} + \sum_{t=1}^{T-1} \beta_{tj} D_{it} + \sum_{k=1}^{K-1} \gamma_{kj} X_{ik} + \sum_{t=1}^{T-1} \sum_{k=1}^{K-1} \delta_{ktj} X_{ik} D_{it} + \sum_{p=1}^{P} \lambda_{pj}^{Z} Z_{ip} + \sum_{t=1}^{T-1} \sum_{p=1}^{P} \lambda_{ptj}^{TZ} D_{it} Z_{ip} \qquad 1.$$

where y_{ij} is the logit transform of the expected probability that person i (= 1,...N) will be in category j (= 1,...J) of voting behavior, the X_{ik} (k = 1,...K) are dummy variables for the class categories, the D_{it} (t = 1,...T) are dummy variables for the time periods, and the Z_{ip} (p = 1,...P) are the control variables. If all of the Z_{ip} are dummy variables, then Equation 1 is equivalent to the loglinear model. The δ_{jkt} terms express the changes in class voting as a three-way MLR interaction term among vote, class, and election. If no constraints are placed on the order of the δ_{jkt} terms, then the MLR model is an operationalization consistent with the "total class voting" approach (Hout et al 1994) because the model allows the δ_{jkt} terms to change the differences among classes over time. From the "traditional class voting" perspective, realignments are tantamount to declines. The "uniform change" model, patterned after the "unidiff" model of Erikson & Goldthorpe (1992), is the multivariate expression of the "traditional" approach (Nieuwbeerta & De Graaf 1994, Weakliem & Heath 1994b). The uniform change model replaces the δ_{jkt} terms with multipliers that do not vary among classes (δ_{jt}—dropping the k subscript). Under "uniform change" the relative distances between classes do not change over time; the persistent differences among classes are simply expanded or contracted by the election-specific multiplier δ_{jt} (see Hout et al 1994 for details). It is that property of the uniform change model that captures the key proposition of the traditional perspective: Classes can be ranked according to an unchanging order that corresponds to the left-to-right ranking of parties even if the strength of association between class and voting might change from election to election.

LINKING MODELS AND HYPOTHESES Within the traditional approach, the uniform change model can be used to test the hypothesis of "declining political significance of class" (Nieuwbeerta & De Graaf 1994). The multiplier δ_{jt} replaces the Alford index as the measure of class voting. If δ_{jt} declines over time, then the results support the hypothesis of declining significance. If δ_{jt} changes significantly over time, but significant increases follow significant decreases, then the alternative of "trendless fluctuation" would be the appropriate conclusion. If δ_{jt} does not change significantly over time, then the results support a "persistent class politics" interpretation.

If the uniform change model fails to fit the data as well as the unconstrained version of MLR (Eq. 1), then the number of δ terms goes up from one for each combination of election and outcome (t,j) to K, i.e. the number of classes. This loss of parsimony is a serious consideration. Hout et al (1994) propose the standard deviation of the δ_{jkt} terms among classes (but within elections and voting outcomes), an index of class voting comparable to δ_{jt} and the Alford index. When the effect of class is zero for some combination of voting outcomes (j) and election (t), then $\delta_{jkt} = 0$ for all k within that combination $\{t,j\}$, so appa$_{jt} = 0$. Likewise, increases in class effects (δ_{jkt}) will result in a proportional increase in appa$_{jt}$ (see Hout et al 1994 for details).

These two indices based on multivariate models—δ_{jt} and appa$_{jt}$—have a number of desirable statistical properties that make them more defensible and sensitive measures of class voting than the Alford index is. First, they do away with the potential contamination of the Alford index due to shifts in the distributions of classes and/or parties. Moreover, because they do not require that class and vote choice be reduced to dichotomies, they are flexible tools for comparative and historical analysis. The choice between δ_{jt} and appa$_{jt}$ depends on whether the traditional (δ_{jt}) or total (appa$_{jt}$) class effects model provides a better fit to the data.

CLASS AND POLITICAL PARTICIPATION

To this point we have considered research on the relationship between class and voting. We now take up the question of class and political participation. Most of the discussion in this section focuses explicitly on the United States, which is alone (with Switzerland) among the western democracies for its unusually low levels of voting in national elections (e.g. Powell 1986, Jackman 1987, Piven & Cloward 1988). Not surprisingly, the decline in national turn-out rates in Presidential elections (from a range of 69–83% in the 1840–1896 period to a range of 49–61% in the 1920–1994) period has prompted a vast literature on the causes of nonvoting in the United States, literature dating as far back as 1924 (Merriam & Gosnell 1924). While most researchers have long recognized class biases in participation rates (e.g. Milbrath 1971:116: "No matter how class is measured, studies consistently show that higher-class persons are more likely to participate in politics than lower-class persons"; see also Wolfinger & Rosenstone 1980, Burham 1982, Piven & Cloward 1988, Cunningham 1991), there have been vigorous debates about the sources and magnitude of class differences. Three controversies in the nonvoting literature that bear on larger questions relating to class politics can be distinguished. First, there are debates over the microlevel factors that encourage or discourage participation on the part of individual voters. A second, related debate concentrates on the sources of the turnout decline since the early 1960s. Finally, there are debates over the sources of the macrolevel institutional structures that constrain voting, and the relationship of institutional arrangements to microlevel factors. Each of these scholarly debates is considered briefly in this section of the paper.

The microparticipation debate was initially framed by the search for the appropriate set of variables that could "explain" nonvoting (Agger et al 1964, Cassel & Hill 1981). Wolfinger & Rosenstone's (1980) influential analysis of turnout in the 1972 US presidential election found that in a multivariate probit analysis, education explained away most of the effects of income and class on turnout. Other studies have similarly emphasized the importance of cognitive skills and a sense of political efficacy in the voter who surmounts the administrative hurdles to voter registration found in most states in the United States (e.g. Abramson & Aldrich 1982, Aldrich & Simon 1986). Leighley & Nagler (1992b) have recently extended the Wolfinger/Rosenstone analysis, analyzing the relationship between the same social structural variables and turnout in conjunction with a state-by-state analysis of registration rules, party competition, and unionization rates. They found that including the systemic variables in the analysis produced only a slightly better fit, and that these variables had virtually no effect on the impact of social-structural variables on voter turnout.

The importance of class for nonvoting has been most systematically addressed in analyses of falling rates of turnout since the early 1960s, what Brody (1978) has termed the "puzzle" of increased nonvoting in a period when rising educational levels and the loosening of racial and other barriers to voter registration should have led to increased turnout. Burnham's (1982, 1987) work on this question has forcefully argued that the "class skew" in turnout has increased steadily throughout the twentieth century, continuing in recent decades. In an analysis of participation data in the Boston metropolitan area, Burnham (1987) finds that turnout for people classified as "working class" by the census categories has declined substantially since 1960. Using income and education as proxies for "class," Reiter (1979) found significant class bias in turnout decline among whites (but not blacks) (also Bennett 1991). More recently, Weakliem & Heath (1994b) found (using an EGP class scheme) a significant increase in class turnout bias since the 1960s in the United States, a pattern not found in either Britain or France.

Other scholars, using income as a proxy for "class," have found no significant increase in class turnout bias in the United States (Leighley & Nagler 1992a). Teixeira's (1987) comprehensive analysis of turnout decline between

1960 and 1984, using a manual/nonmanual class dichotomy, also concludes that class and other social structural forces did not contribute to the turnout decline during this period. He argues that while some kinds of changes (rising education levels) encourage rising turnout, other factors (increased geographic mobility) serve to neatly cancel out such changes. Instead, he argues that "sociopolitical" factors such as declines in partisanship, political efficacy, and campaign newspaper reading explain away the post-1964 decline (1987: Ch. 4).

Analyses focusing on microlevel explanations of nonvoting tend, as Piven & Cloward (1988:113) have suggested, to attribute to individual voters the causes for their failure to participate. But the same individual level factors that serve to reduce turnout in the United States have few significant effects in most other countries (Crewe et al 1977, Burnham 1982, Powell 1986, Smeenk 1994; but see Swaddle & Heath [1989], who find evidence of class bias in recent British elections). Focusing on the institutional sources of nonvoting, macrolevel approaches offer very different understandings of the exceptionalism of US turnout. Two broad sets of theories can be distinguished (cf Piven & Cloward 1988: Ch. 4): those that emphasize changes in the party system after 1896, in particular declining party competition (Kleppner 1982, Burnham 1982), and those emphasizing the imposition of restrictive registration rules (Campbell et al 1960: Ch. 11, Kelley et al 1967, Converse 1974, Rusk 1974, Cunningham 1991). Piven & Cloward (1988) offer a class-centered interpretation of the origins of restrictive registration laws, arguing that these laws can be traced to the efforts of political elites to reduce the electoral threats from mass politics, and that franchise restrictions have crucial consequences for class politics in the United States, increasing the difficulties faced in organizing a labor party and reducing the incentives for the major parties to appeal to working class interests. Highton (1994) has recently challenged Piven & Cloward's claims about the class consequences of registration laws, showing levels of socioeconomic turnout bias in states with no or very lax registration requirements similar to those of states with restrictive registration laws.

CONCLUSION

Some recent scholarly analyses have suggested that the relationship between class and voting in the capitalist democracies of Western Europe & North America since 1945 can be characterized as undergoing a process of "dealignment." Advances in class theory, statistical methods, and the availability of high-quality data have encouraged others to reassess claims that the intrinsic importance of class for electoral politics is declining. Many recent studies conclude that the trends are better characterized as either "trendless fluctuation" or in exceptional cases "realignment." Efforts are underway to coordinate the next wave of reassessments in a way that will facilitate cross-national comparisons. At this juncture only one conclusion is firm: In no democratic capitalist country has vote been entirely independent of class in a national election.

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Literature Cited

Abramson PR, Aldrich JH. 1982. The decline of electoral participation in America. *Am. Polit. Sci. Rev.* 76:502–21

Abramson PR, Inglehart R. 1992. Generational replacement and value change in eight west European societies. *Br. J. Polit. Sci.* 22:183–228

Achen CH. 1992. Social psychology, demographic variables, and linear regression: breaking the iron triangle in voting research. *Polit. Behav.* 14:195–211

Agger RE, Goldrich D, Swanson BE. 1964. *The Rulers and the Ruled: Political Power and Impotence in American Communities.* New York: Wiley

Aldrich JH, Simon DM. 1986. Turnout in American national elections. *Res. Micropolit.* 1:271–301

Alford RR. 1963. *Party and Society.* Chicago: Rand McNally

Alford RR. 1967. Class voting in Anglo-American political systems. See Lipset & Rokkan 1967a, pp. 67–94

Alford RR, Friedland R. 1985. *Powers of Theory: Capitalism, Democracy and the State.* New York: Cambridge Univ Press

Alt J, Turner J. 1982. The case of the silk-stocking socialists and the calculating children of the middle class. *Br. J. Polit. Sci.* 12:273–90

Anderson D, Davidson PE. 1943. *Ballots and the Democratic Class Struggle.* Stanford, CA: Stanford Univ. Press

Baker KL, Dalton RJ, Hildebrandt K. 1981. *Germany Transformed: Political Culture and the New Politics.* Cambridge, MA: Harvard Univ. Press

Balbus I. 1982. *Marxism and Domination.* Princeton: Princeton Univ. Press

Barrow C. 1993. *Theories of the State.* Madison, WI: Univ. Wisc. Press

Bartolini S, Mair P. 1990. *Identity, Competition, and Electoral Availability: The Stabilisation of European Electorates, 1885–1985.* New York: Cambridge Univ. Press

Baumann Z. 1982. *Memories of Class.* London: Routledge & Kegan Paul

Bennett SE. 1991. Left behind: explaining declining turnout among noncollege young whites, 1964–88. *Soc. Sci. Q.* 72:314–33

Berelson BR, Lazarsfeld PF, McPhee WN. 1954. *Voting: A Study of Opinion Formation in a Presidential Campaign.* Chicago: Univ. Chicago Press

Brint S. 1994. *In An Age of Experts: The Changing Role of Professionals in Politics and Public Life.* Princeton: Princeton Univ. Press

Brody RA. 1978. The puzzle of participation. In *The New American Political System,* ed. A King, pp. 291–99. Washington DC: Am. Enterprise Inst.

Brooks C, Manza J. 1994. Do changing values explain the new politics? A critical assessment of the postmaterialist thesis. *Sociol. Q.* 36:541–70

Brym RF, Gillespie MW, Lenton RL. 1989. Class power, class mobilization, and class voting: the Canadian case. *Can. J. Sociol.* 14:25–44

Burnham WD. 1982. *The Current Crisis in American Politics.* New York: Oxford Univ. Press

Burnham WD. 1987. The turnout problem. In

Elections American Style, ed. AJ Reichley, pp. 97–133. Washington, DC: Brookings Inst.

Campbell A, Converse PE, Miller WE, Stokes DE. 1960. *The American Voter*. New York: Wiley

Cassel CA, Hill DB. 1981. Explanations of turnout decline: a multivariate test. *Am. Polit. Q.* 9:181–95

Clark TN, Lipset SM. 1991. Are social classes dying? *Int. Sociol.* 8:397–410

Clark TN, Lipset SM, Rempel M. 1993. The declining political significance of social class. *Int. Sociol.* 8:293–316

Cohen JL. 1982. *Class and Civil Society*. Amherst, MA: Univ. Mass. Press

Converse PE. 1964. The nature of belief systems in mass publics. In *Ideology and Discontent*, ed. D Apter, pp. 206–61. New York: Free

Converse PE. 1974. Comment on Burnham's "Theory and Voting Research." *Am. Polit. Sci. Rev.* 68:1024–27

Crewe I. 1986. On the death and resurrection of class voting: some comments on how Britain votes. *Polit. Stud.* 34:620–38

Crewe I, Fox T, Alt J. 1977. Non-voting in British general elections, 1966–October 1974. In *British Political Sociology Yearbook*, ed. C Crouch, pp. 38–109. London: Croom Helm

Cunningham D. 1991. Who are to be the electors? A reflection on the history of voter registration in the U.S. *Yale Law Policy Rev.* 9:370–404

Dalton RJ. 1988. *Citizen Politics in Western Democracies: Public Opinion and Political Parties in the United States, Great Britain, West Germany, and France*. Chatham, NJ: Chatham House

Dalton RJ, Flanagan SC, Beck PA, eds 1984. *Electoral Change in Advanced Industrial Democracies*. Princeton, NJ: Princeton Univ. Press

De Graaf ND, Nieuwbeerta P, Heath A. 1995. Class mobility and political preferences: individual and contextual effects. *Am. J. Sociol.* 100:97–127

Downs A. 1957. *An Economic Theory of Democracy*. New York: Harper & Row

Duke V, Edgell S. 1984. Public expenditure cuts in Britain and consumption cleavages. *Int. J. Urban Regional Res.* 8:177–201

Dunleavy P. 1980. The political implications of sectoral cleavages and the growth of state employment Parts 1 and 2. *Polit. Stud* 28: 364–83, 527–49

Dunleavy P. 1987. Class dealignment revisited. *West Eur. Polit.* 10:400–19

Edsall TB. 1984. *The New Politics of Inequality*. New York: Norton

Edsall TB, Edsall MD. 1991 *Chain Reaction: The Impact of Race, Rights and Taxes on American Politics*. New York: Norton

Engels, F. 1978. [1895.] "Introduction to *The Class Struggles in France, 1848–1850.*" In *The Marx-Engels Reader*, comp. RC Tucker, pp. 556–73. New York: Norton

Erikson R, Goldthorpe JH. 1992. *The Constant Flux: A Study of Class Mobility in Industrial Societies*. Oxford: Clarendon

Erikson R, Goldthorpe JH, Portocarero L. 1979. Intergenerational class mobility in three West European societies. *Br. J. Sociol.* 30: 415–41

Esping-Anderson G. 1994. *The eclipse of the democratic class struggle? European class structures at fin de siecle*. Unpublished ms., Univ. Trento, Italy

Evans G. 1993. Class, prospects and the lifecycle: explaining the association between class position and political preferences. *Acta Sociol.* 36:263–76

Evans G, Heath A, Payne C. 1991. Modelling trends in the class/party relationship, 1964–1987. *Electoral Stud.* 10:99–117

Eyerman R, Svensson LG, Soderqvist T. 1987. *Intellectuals, Universities and the State in Western Modern Societies*. Berkeley: Univ. Calif. Press

Flanagan SN, Dalton RJ. 1984. Parties under stress: realignment and dealignment in advanced industrial societies. *West Eur. Polit.* 7:7–23

Frankel DM. 1991. Class, social networks, and labour party support in Great Britain. *Res. Soc. Stratification Mobility* 10:345–64

Franklin MN. 1985. *The Decline of Class Voting in Britain*. New York: Oxford Univ. Press

Franklin MN. 1992b. The decline of cleavage politics. See Franklin et al 1992, pp. 383–405

Franklin MN, Mackie TT, Valen H. 1992b. Introduction. See Franklin et al 1992, pp. 3–32

Franklin MN, Mackie TT, Valen H. 1992b. *Electoral Change: Responses to Evolving Social and Attitudinal Structures in Western Countries*. New York: Cambridge Univ. Press

Franklin MN, Page EC. 1984. A critique of the consumption cleavage approach in British voting studies. *Polit. Stud.* 32:521–36

Goldthorpe JH. 1987. *Class and Mobility in Modern Britain*. Oxford: Clarendon Press. 2nd ed.

Goldthorpe JH. 1994. *Models for class voting*. Presented at World Congr. Int. Sociol. Assoc., 13th, Bielefeld, Germany

Goldthorpe JH, Lockwood D, Bechhofer F, Platt J. 1968. *The Affluent Worker: Political Attitudes and Behavior*. Cambridge: Cambridge Univ. Press

Goldthorpe JH, Marshall G. 1992. The promising future of class analysis: a response to recent critiques. *Sociology* 26:381–400

Goodman L. 1965. On the multivariate analysis of three dichotomous variables. *Am. J. Sociol.* 71:290–301

Gorz A. 1982. *Farewell to the Working Class.* Boston: South End

Gouldner AW. 1979. *The Future of Intellectuals and the Rise of the New Class.* New York: Continuum

Halle D, Romo F. 1991. The blue collar working class: continuity and change. In *America at Century's End,* ed. A Wolfe, pp. 152–184. Berkeley: Univ. Calif. Press

Hamilton RF. 1967. *Affluence and the French Worker.* Princeton: Princeton Univ. Press

Hamilton RF. 1972. *Class and Politics in the United States.* New York: Wiley

Hamilton RF, Wright J. 1986. *The State of the Masses.* Hawthrone, NY: Aldine de Gruyter

Haynes SE, Jacobs D. 1994. Macroeconomics, economic stratification, and partisanship. a longitudical analysis of contingent shifts in political identification. *Am. J. Sociol.* 100: 70–103

Heath A, Jowell R, Curtice J. 1985. *How Britain Votes.* London: Pergamon

Heath A, Jowell R, Curtice J. 1987. Trendless fluctuation: a reply to Crewe. *Polit. Stud.* 35:256–77

Heath A, Jowell R, Curtice J, Field J, Evans G, Witherspoon S. 1991. *Understanding Political Change: The British Voter, 1964–1987.* London: Pergamon

Hibbs D. 1982. Economic outcomes and political support for British government among occupational classes: a dynamic analysis. *Am. Polit. Sci. Rev.* 76:255–79

Hobsbawm E. 1981. The forward march of labor halted. In *The Forward March of Labour Halted?,* ed. M Jacques, F Mulhenn, pp 1–19. London: Verso

Highton, B. 1994. *Easy registration and voter turnout.* Presented at Annu. Meet. Am. Polit. Assoc., New York, NY

Hout M. 1988. More universalism, less structural mobility. *Am. J. Sociol.* 93:1358–1401

Hout M, Brooks C, Manza J. 1993. The persistence of classes in postindustrial societies. *Int. Sociol.* 8:259–77

Hout M, Brooks C, Manza J. 1994. *The democratic class struggle in the United States, 1948–1992.* Presented at World Congress of Int. Sociol. Assoc., 13th, Bielefeld, Germany

Huckfeldt R, Kohfeld CW. 1989. *Race and the Decline of Class in American Politics.* Champaign, IL: Univ. Ill. Press

Inglehart R. 1977. *The Silent Revolution.* Princeton, NJ: Princeton Univ. Press

Inglehart R. 1984. The changing structure of political cleavages in western society. See Dalton et al 1984, pp. 25–69

Inglehart R. 1990. *Culture Shift in Advanced Industrial Society.* Princeton, NJ: Princeton Univ. Press

Inglehart R, Abramson PR. 1994. Economic security and value change. *Am. Polit. Sci. Rev.* 88:336–54

Inglehart R, Rabier JR. 1986. Political realignment in advanced industrial society: from class-based politics to quality of life politics. *Govt. Opposition* 21:456–79

Jackman RW. 1987. Political institutions and voter turnout in the industrial democracies. *Am. Polit. Sci. Rev.* 81:405–23

Kelley J, McAllister I. 1985. Class and party in Australia: comparison with Britain and the USA. *Br. J. Sociol.* 36:383–420

Kelley J, McAllister I, Mughan A. 1985. The decline of class revisited: class and party in England, 1964–1979. *Am. Polit. Sci. Rev.* 79: 719–37

Kelley S, Ayres RE, Bowen WG. 1967. Registration and voting: putting first things first. *Am. Polit. Sci. Rev.* 61:359–79

Kinder DR, Kieweit DR. 1981. Sociotropic politics: the American case. *Br. J. Polit. Sci.* 11:129–61

Kleppner P. 1982. *Who Voted? The Dynamics of Electoral Turnout, 1870–1980.* New York: Praeger

Knoke D, Hout M. 1976. Reply to Glenn. *Am. Sociol. Rev.* 41:905–8

Korpi W. 1972. Some problems in the measurement of class voting. *Am. J. Sociol.* 78:627–42

Korpi W. 1983. *The Democratic Class Struggle.* London: Routledge

Laclau E, Mouffe C. 1985. *Hegemony and Socialist Strategy.* London: Verso

Lash S, Urry J. 1987. *The End of Organized Capitalism.* Madison: Univ. Wisc. Press

Lazarsfeld PF, Berelson BR, Gauzet H. 1948. *The People's Choice.* New York: Columbia Univ. Press. 2nd ed.

Leighley JE, Nagler J. 1992a. Socioeconomic class bias in turnout, 1964–1988: the voters remain the same. *Am. Polit. Sci. Rev.* 86: 725–36

Leighley JE, Nagler J. 1992b. Individual and systemic influences on turnout: who votes? *J. Polit.* 54:718–40

Lipset SM 1981 [1960]. *Political Man.* Baltimore: Johns Hopkins Univ. Press. Expanded Ed

Lipset SM. 1985. *Consensus and Conflict: Essays in Political Sociology.* New Brunswick, NJ: Transaction

Lipset SM, Lazarsfeld PF, Barton AH, Linz J. 1954. The psychology of voting: an analysis of political behavior. In *Handbook of Social Psychology,* ed. G. Lindzey, pp. 1124–75. Cambridge, MA: Addison-Wesley

Lipset SM, Rokkan S, eds. 1967a. *Party Systems and Voter Alignments.* New York: Free

Lipset SM, Rokkan S. 1967b. Cleavage structures, party systems and voter alignments: an introduction. In *Party Systems and Voter Alignments*, ed. SM Lipset, S Rokkan, pp. 1–64. New York: Free

Logan JR, Molotch HL. 1987. *Urban Fortunes: The Political Economy of Place*. Berkeley: Univ. Calif. Press

Markland S. 1990. Structures of modern poverty. *Acta Sociol.* 33:125–40

Marshall G, Rose D, Newby H, Vogler C. 1988. *Social Class in Modern Britain*. London: Unwin Hyman

Meisel J. 1975. *Working Papers on Canadian Politics*. Montreal: McQuill-Queen's Univ. Press. 2nd ed.

Merriam CE, Gosnell HF. 1924. *Non-Voting: Causes and Methods of Control*. Chicago: Univ. Chicago Press

Milbrath LW. 1971. *Political Participation: How and Why Do People Get Involved in Politics*. Chicago: Rand McNally

Minkenberg M, Inglehart R. 1989. Neoconservatism and value change in the USA: tendencies in the mass public of a postindustrial society. In *Contemporary Political Culture*, ed. JR Gibbons, pp. 81–109. Newbury Park, CA: Sage

Myles JF. 1979. Differences in the Canadian and American class vote: fact or pseudofact? *Am. J. Sociol.* 84:1232–37

Nie N, Verba S, Petrocik J. 1981. *The Changing American Voter*. Cambridge, MA: Harvard Univ. Press. 2nd ed.

Nieuwbeerta P. 1994. *The democratic class struggle in twenty countries, 1945–90*. PhD thesis. Univ. Nijmegen

Nieuwbeerta P, De Graaf ND. 1994. *Class voting and the influence of varying class structures in 16 western countries, 1956–1990*. Presented at World Congress Int. Sociol. Assoc., 13th, Bielefeld, Germany

Nieuwbeerta P, De Graaf ND, Ultee W. 1992. *Social class, government sector and political preferences: evidence from Germany, the Netherlands, and the United States*. Presented at Meet. Int. Sociol. Assoc. Res. Committee 28, August 16–18, Salt Lake City, Utah

Offe C. 1985. New social movements: challenging the boundaries of institutional politics. *Soc. Res.* 52:817–68

Offe C. 1992. Smooth consolidation in the West German welfare state: structural change, fiscal policies, and populist politics. See Piven 1992b, pp. 124–146

Ogburn WF, Coombs LC. 1940. The economic factor in the Roosevelt elections. *Am. Polit. Sci. Rev.* 34:719–27

Ogburn WF, Hill E. 1935. Income classes and the Roosevelt vote. *Polit. Sci. Q.* 50: 186–93

Ogmundson R. 1975. Party class images and the class vote in Canada. *Am. Sociol. Rev.* 40:506–12

Parkin F. 1968. *Middle Class Radicalism*. New York: Praeger

Pierson C. 1991. *Beyond the Welfare State*. Univ. Park, PA: Penn State Univ. Press

Piven FF. 1992a. The decline of labor parties: an overview. See Piven 1992b, pp. 1–19

Piven FF, ed. 1992b. *Labor Parties in Postindustrial Societies*. New York: Oxford Univ. Press

Piven FF, Cloward RA. 1988. *Why Americans Don't Vote*. New York: Pantheon

Powell GB. 1986. American voter turnout in comparative perspective. *Am. Polit. Sci. Rev.* 80:17–43

Przeworski A. 1980. Social democracy as a historical phenomenon. *New Left Rev.* 122: 27–58

Przeworski A, Sprague J. 1986. *Paper Stones: A History of Electoral Socialism*. Chicago: Univ. Chicago Press

Pulzer P. 1987. The paralysis of the centre-left: a comparative perspective. *Polit. Q.* 58:378–88

Reiter HL. 1979. Why is turnout down? *Public Opin. Q.* 43:297–311

Ringdal K, Hines K. 1994. *Patterns in class voting in Norway 1957–1989: dealignment of "trendless fluctuations"?* Unpublished ms. Univ. Trondheim, Norway

Rose R, ed. 1974a. *Electoral Behavior: A Comparative Handbook*. New York: Free

Rose R. 1974b. Comparability in electoral studies. See Rose 1974a, pp. 3–25

Rose R, McAllister I. 1986. *Voters Begin to Choose· From Closed Class to Open Elections in Britain*. Newbury Park, CA: Sage

Rose R, Urwin D. 1970. Persistence and change in Western party systems since 1945. *Polit. Stud.* 18:287–319

Rusk JG. 1974. Comment: the American electoral universe: speculation and evidence. *Am. Polit. Sci. Rev.* 68:1028–49

Sainsbury D. 1985. The electoral difficulties of the Scandanavian social democrats in the 1970s. *Compar. Polit.* 18:1–19

Sainsbury D. 1990. Party strategies and the electoral trade-off of class-based parties. *Eur. J. Polit. Res.* 18:29–50

Sarlvik B, Crewe I. 1983. *Decade of Dealignment: The Conservative Victory of 1979 and Electoral Trends in the 1970s*. New York: Cambridge Univ. Press

Scarbrough E. 1987. The British electorate twenty years on: electoral change and election surveys. *Br. J. Polit. Sci.* 17:219–46

Shanks MG, Miller WE. 1990. Policy direction and performance evaluation: complementary explanations of the Reagan elections. *Br. J. Polit. Sci.* 20:143–235

Shanks MG, Miller WM. 1993. *Performance, policy, partisanship, and Perot: alternative interpretations of the 1992 elections*. Presented at Annu. Meet. Am. Polit. Sci. Assoc., Washington DC

Siegfried A. 1913. *Tableau Politique de la France de l'Ouest sous la Troisieme Republique*. Paris: Librairie Amand Colin

Smeeding TM. 1991. Cross-national comparisons of inequality and poverty position. In *Economic Inequality and Poverty: International Perspectives*, ed. L Osberg, pp. 39–59. Armonk, NY: ME Sharpe

Smeenk W. 1994. *Non-voting in the Netherlands and the United States*. Presented at Annu. Meet. Am. Sociol. Assoc., 89th, Los Angeles, CA

Smith ER. 1989. *The Unchanging American Voter*. Berkeley: Univ. Calif. Press

Sorensen AB. 1991. On the usefulness of class analysis in research on social mobility and socioeconomic inequality. *Acta Sociol.* 34: 71–87

Swaddle K, Heath A. 1989. Official and reported turnout in the British general election of 1987. *Br. J. Polit. Sci.* 19:537–70

Taylor-Gooby P. 1986. Consumption cleavages and welfare politics. *Polit. Stud.* 34:592–606

Teixeira RA. 1987. *Why Americans Don't Vote: Turnout Decline in the United States, 1960–84*. New York: Greenwood

Tufte E. 1978. *Political Control of the Economy*. Princeton: Princeton Univ. Press

Turner F, ed. 1992. *Social Mobility and Political Attitudes: Comparative Perspectives*. New Brunswick, NJ: Transaction

Sorensen AB. 1991. On the usefulness of class analysis in research on social mobility and socioeconomic inequality. *Acta Sociol.* 34: 71–87

Weakliem DL. 1989. *Class and Party in Britain, 1964–1983*. *Sociology* 23:285–97

Weakliem DL. 1991. The two lefts? Occupation and party choice in France, Italy, and the Netherlands. *Am. J. Sociol.* 96:1327–61

Weakliem DL. 1992. Does social mobility affect political behavior? *Eur. Sociol. Rev.* 8: 153–65

Weakliem DL. 1995. Two models of class voting. *Br. J. Polit. Sci.* 25: In press

Weakliem DL, Heath AF. 1994a. Rational choice and class voting. *Rationality & Society* 6:243–70

Weakliem DL, Heath AF. 1994b. *The secret life of class voting: Britain, France, and the United States since the 1930s*. Presented at World Congress of Int. Sociol. Assoc., 13th, Bielefeld, Germany

Wolfinger RE, Rosenstone SJ. 1980. *Who Votes?* New Haven: Yale Univ. Press

Wright EO. 1978. *Class, Crisis, and the State*. London: New Left

Wright EO. 1985. *Classes*. London: Verso

Wright EO. 1989. Rethinking, once again, the concept of class structure. In *The Debate on Classes*, ed. EO Wright et al, pp. 269–348. London: Verso

Zipp JF, Smith J. 1982. A structural theory of class voting. *Soc. Forc.* 60:738–59

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THE EASTERLIN EFFECT

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ABSTRACT

The Easterlin effect posits cyclical changes in demographic and social behavior as the result of fluctuations in birth rates and cohort size during the post–World War II period. Large cohort size reduces the economic opportunities of its members and reduces income relative to smaller parental generations. Low relative economic status in turn leads to lower fertility, higher rates of female labor force participation, later marriage, higher divorce and illegitimacy, and increasing homicide, suicide, and alienation. Cycles in birth rates and cohort size suggest that the small baby bust cohorts entering adulthood in the 1990s will enjoy higher relative income, more traditional family structures, and lower levels of social disorganization.

Of interest to economists and sociologists, the Easterlin effect has generated a large literature in the several decades since it was first proposed. Our review of the empirical studies notes the diversity of support across behaviors, time periods, and nations. Up to 1980, changes in wages, fertility, and social disorganization closely matched cohort size, but individual-level studies found little influence of relative income within cohorts. Further, the correspondence of the trends ends in the 1980s and appears in few countries other than the United States. Our review emphasizes both the contingent nature of the Easterlin effect and the way in which conditions have changed in recent decades to reduce the salience of cohort size for social and demographic behavior.

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INTRODUCTION

More than 25 years ago, Richard Easterlin presented his basic argument that swings in relative cohort size and resulting levels of relative income among cohorts of child-bearing age produced the baby boom and then the baby bust. Initially concerned with describing demographic cycles (Easterlin 1961), his work followed with more developed statements (Easterlin 1968, 1971, 1973) that offered an original explanation of the baby boom and bust. Easterlin (1978, 1987a) later expanded the arguments concerning fertility to claim more provocatively that shifting relative cohort size also explains trends in the United States of marriage, divorce, education, female labor force participation, homicide, suicide, and alienation. Not surprisingly, numerous studies of the theoretical claims have emerged in the sociological, economic, and demographic literatures. The empirical evaluations cover as extensive a list of topics as the theory itself, thus presenting a diverse domain of findings not easily comprehended by specialists on any one of the delimited topics addressed by Easterlin's theory.

We offer a review of the Easterlin effect with the following characteristics. First, the review generalizes across behaviors. Studies offering evidence pro and con within the various specialties of fertility, family, work, education, and deviance need comparison and integration. Since the power of the theory comes from its claim that the same underlying changes in age structure affect a wide variety of behaviors, an adequate review must likewise cover research on the same wide variety of behaviors. The review must also cover disciplines besides mainstream sociology relevant to Easterlin's arguments. Second, the review examines comparative evidence on the Easterlin effect. Although applied to the United States, the theory has implications for similarly high income European nations. Moreover, making sense of differences in support of the theory found for the United States compared to European nations can help identify the strengths and weaknesses of the theory. Third, the review considers the temporal scope of the theory. Shifts in gender roles and values may mean the theory applies less well to recent experiences than to those in past decades. Fourth, the review appraises the multiple methods researchers have used to test for the effect of relative cohort size. Much research uses aggregate data to measure directly the impact of relative size of age groups on societal outcomes while other research employs micro-level data to link cohort membership to individual behavior. The different methods often result in conflicting findings.

REVIEW OF THE THEORY

According to Easterlin, economic and social fortunes stem from relative economic status—the comparison of income-earning possibilities to expected standard of living. The expected standard of living of adults comes from their childhood economic socialization: The standard of living that persons become accustomed to during childhood creates aspirations against which they compare their income potential during young adulthood. Income-earning possibilities stem from labor market experience. The higher one's income potential is relative to expected standard of living, the higher one's relative economic status. Demographic behavior, economic decision-making, and social well-being thus result from an individual's or couple's comparison of resources to aspirations.

Cohort size represents the key determinant of both income potential and expected standard of living. Income potential depends on the size of cohorts entering the labor force, while the expected standard of living depends on the size of cohorts of the previous generation. All else equal, the larger the cohort, the lower the potential income of members. As the principle holds over time, the size of a cohort relative to previous cohorts reflects a generation's income potential relative to the income of the parental generation and to its expected standard of living; the ratio thus represents a short-hand measure of relative income. A large youth cohort relative to the parental cohort results in relatively low income; a small youth cohort relative to the parental cohort results in high relative income. The dynamics of cohort counterpoint, based on the 20 years separating the birth of cohorts from their entrance into the labor force, specify the existence of new Kuznets cycles alternating two decades of good times and two decades of bad times.[1]

Economic and social fortunes tend to vary inversely with relative cohort size because large cohorts face problems of crowding in three institutions (Easterlin 1987b). First, crowding in the family reduces the attention and energy parents can devote to their children, which in turn delays development and achievement of children. Second, crowding in educational institutions reduces learning opportunities and attainment of students in large cohorts. As human and physical capital in school systems cannot keep pace with the surge in population size, the quality of teachers and of the curriculum declines. Third, labor market institutions cannot easily absorb the large number of potential workers. The problems faced by large cohorts in each institutional stage of the early life cycle tend to accumulate: Family crowding exacerbates poor educational performance, educational crowding reduces the skills students can bring into the labor force, and labor market crowding limits job opportunities. Together, limited family, educational, and labor market resources of large cohorts contribute to high job competition, low wages, slow promotion, and low income potential.[2] The economic costs last throughout the life cycle, requiring adaptive behavior even well into retirement (Easterlin et al 1990a).

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[1] The focus on demographic cycles, dating back to some of Easterlin's (1961) early work on American economic history, has helped to generate a literature in the area of population mathematics and debate over the possibility of self-limiting population cycles (Samuelson 1976, Lee 1976, Wachter & Lee 1984, Wachter 1991).

Cycles in relative economic status shape a wide variety of outcomes. Low fertility represents an adaptation to low relative income: In order to maintain consumption standards similar to those they were raised with, couples limit their childbearing and the expenses associated with children. Working wives, delayed marriage, and later ages of childbearing represent other adaptations. Further, with low relative income, men less willingly take on the economic responsibilities of a family, and this hesitation results in high rates of abortion, illegitimate births, and divorce. These adaptations tend to modify the economic impact of relative cohort size upon the couple, but increase the demographic impact of a cohort's low relative income. Thus, "Altered demographic behavior has been the key to transforming adverse labor market conditions into favorable living conditions" (Easterlin et al 1990b:278). Members of the baby boom cohort, for instance, maintain desired consumption at the cost of non-economic aspects of well-being (Easterlin et al 1993a). Despite the low wages of boomers, income adjusted for their smaller family size and larger number of earners per family exceeds by 66% the adjusted income of the parental generation (Easterlin et al 1993b).

With these adaptations, however, men in large cohorts may feel stress and disappointment because they are unable to fulfill traditional roles. The sacrifice of family life to maintain economic status likely induces stress, which results in social malaise, crime, suicide, and alienation. In contrast, members of small cohorts do not face the same conflict between resources and aspirations; their high relative income allows them to meet their consumption aspirations even while marrying early, having many children, and maintaining traditional family roles.

Easterlin (1987a:5) does not claim that cohort size is the only or dominant determinant of the behaviors he studies. Rather, he argues that age structure is more pervasive and important than recognized. Other noncyclical factors in work, family, and social organization may generate secular trends from which the cohort-based cycles represent deviations. Both types of change contribute to an understanding of recent social trends, but Easterlin concentrates only on the latter. In fact, Easterlin notes the importance of conditions that facilitate the effect of relative cohort size on behavior: "One would expect cohort size effects to dominate a cohort's experience only when other factors are relatively constant" (Easterlin 1987b:3). Thus, the importance of cohort size may rise and fall in response to other forces of social change. Several conditions may make the birth size of a cohort the primary determinant of labor supply 20 years hence.

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[2] Others see similarly harmful effects of generational crowding and large cohort size, but posit additional causal mechanisms. For instance, the sheer numbers of children relative to parents and teachers, and of new employees relative to employers, make communication of and socialization to family, educational, and occupational values and norms more difficult (Carlson 1980). Incomplete socialization, along with economic pressures, may contribute to low income potential among members of large cohorts.

The first condition specifies that other factors affecting aggregate demand must become sufficiently stabilized that cohort supply can emerge as a major determinant of the economic well-being of individual cohort members. If the business cycle fluctuates from one extreme to the other, aggregate demand changes will swamp the role of relative cohort size. Until governments began to use Keynesian fiscal policies to smooth business cycles after World War II, the aggregate forces of demand made cohort supply less important. Previously, economic growth depended completely on private investment, which tended to exacerbate downturns. When governments began to act counter-cyclically to limit economic recessions, they also made cohort supply a more important determinant of the economic well-being of workers and citizens. As a result, demand for workers relative to their supply receives little attention in the theory.

Second, immigration affecting the supply of workers must also become sufficiently stabilized for the effects of cohort size to emerge. Huge waves of immigrants swamp the importance of birth cohort size by adding to the supply of workers. If immigration rises during periods of high wages and low worker supply, and adds young workers willing to accept lower wages than natives, then it may counteract fertility-based cycles of cohort size. Immigration thus disrupts the sequence of low and high fertility that produces important cycles of relative economic status. Up to the 1920s, steady high rates of immigration into the United States limited the importance of birth cohort size (Easterlin & Schapiro 1979); high immigration in more recent periods may do the same.

Third, the theory presumes a sexual division of labor in the family and in the labor force. Noting that Easterlin's arguments miss the impact of wives' changing economic roles, Oppenheimer (1976:43) states, "As long as wives' labor force participation was very limited, fertility would be more likely to vary markedly in response to the mechanisms posited by Easterlin." Entrance of women into the labor force may compensate for the low income of males in large cohorts. Working mothers, by raising the relative income of large generations, expand the aspirations and reduce the relative income of smaller, subsequent generations. Thus, as female labor force participation increases, it tends to reduce generational differences in economic status and the impact of cycles of cohort size. The recent upward trend in female work may thus attenuate the impact of cohort size. Easterlin (1987a) agrees that higher rates of labor force participation among women in large cohorts do moderate swings in relative income, but he believes they have not eliminated the importance of the cycles altogether.

Fourth, Easterlin's arguments about relative income, particularly as they relate to the differential contribution of male and female work to family finances, assume that employers find younger and older male workers poor substitutes for one another, but treat younger and older women as adequate substitutes. The career trajectory of most male jobs means employers value older and younger men for different skills. Because they lack experience, younger men rarely have the qualifications to fill positions occupied by older men, even when an excess of younger workers coexists with a shortage of older workers. The situation proves different for women, however. Given traditional occupational segregation by gender, and weaker attachment of women to the labor force, women less often than men have jobs with clear career trajectories. Therefore, younger and older women more often compete for the same jobs—they can serve as adequate substitutes for each other. Female labor force participation rises among older women when a shortage of younger women exists, and female labor force participation rises among younger women when a shortage of older women exists. Thus, given the traditional division of labor between men and women in the United States, cohort size as a determinant of economic fortune applies primarily to the experience of men (Freeman 1979).

Fifth, cross-national comparisons suggest some geographical limits of the theory. The arguments apply only to high income industrial economies where children become desired as a consumption goal. In primarily agricultural societies without developed wage labor markets, children contribute to family production, and fertility control remains limited. As O'Connell (1978:242) notes, the effect of cohort size emerges "only in countries that have a fairly complete control over their fertility behavior and are sensitive to the slight changes in economic opportunities produced by changes in the age distribution."

Among high income nations, comparison of the United States with Western Europe suggests another condition in which the effect of relative cohort size emerges—a modest welfare state. If government welfare programs develop too strongly, they may offer policies of full employment and social protection that limit the harmful economic impact of cohort oversupply (Pampel 1993). Full-employment policies limit unemployment, and social protection policies limit the economic impact of loss of work. Thus, Easterlin (1987a:161) suggests that cohort effects hold more for a nation such as the United States than for European nations with older and more generous welfare states.[3]

[3] Carlson (1992) claims that the effect of cohort size differed even more sharply between the United States and Eastern European nations before 1989. He argues that in Eastern European nations large cohorts may have created economic prosperity by producing more workers, and consumers, and that they had higher fertility than smaller cohorts—exactly the reverse of the Easterlin effect.

Together, these restrictions prove consequential. The Easterlin effect should emerge among high income countries during periods of relative economic stability and restrained immigration such as after World War II, particularly among those few high income nations like the United States or Canada without strong institutions of collective social protection. To the extent that conditions change, the Easterlin effect may find itself limited to a historically brief period of 40 years—one cycle—in a small number of countries. Such limitations, while allowing more predictive accuracy for the theory, also detract from its explanatory power.

THEORETICAL IMPORTANCE OF THE EASTERLIN EFFECT

An attractive feature of Easterlin's theory stems from its wide explanatory power and parsimonious explanatory mechanism. The wide explanatory power of the theory shows in its attempt to explain social and economic behavior as diverse as marriage, economic well-being, work, homicide, suicide, alienation, and economic stagflation. Although theories limited to one dimension of social behavior potentially produce as many theories as behaviors, integrative theories such as Easterlin's represent the exception rather than the norm. At the same time, the theory explains the diverse types of behavior as the result of a relatively straightforward set of causal mechanisms. Shifts in age structure, which lend themselves to simple conceptualization and measurement, produce changes in relative economic status, which likewise can be straightforwardly conceptualized even if less easily measured with historical data.

The parsimonious nature of the explanatory mechanisms simplifies issues of causal dominance in the study of diverse social and economic behaviors. Trying to decompose the causal ordering of inherently temporally simultaneous behaviors such as fertility, female labor force participation, marriage, educational attainment, and economic status has occupied the attention of researchers for decades. Some attempt to deal with the problem by using simultaneous models and cross-sectional data, while others rely on longitudinal studies of the timing of events. Easterlin's theory suggests some part of these social and economic behaviors are only spuriously related due to the common cause of relative income. Determining the causal ordering among the outcomes represents a less important problem than assessing the impact of relative income on all the outcomes.

Easterlin (1987a) addresses issues of causal ordering by distinguishing between ex ante and ex post income. Ex ante relative income refers to the status of young adults in the absence of any adjustment to market forces, while ex post income includes behavioral adjustments to raise income. Despite low ex ante income, baby boomers actually increased their ex post income through increases in wives' participation in the work force and a reduction of the number of children (Easterlin et al 1990b). The primacy of ex ante relative income in Easterlin's theory thus simplifies issues of causal ordering.

The importance of Easterlin's theory also comes from its contribution to theories of social change. Whereas most theories of modernization, the demographic transition, and value transformation posit unidirectional change, Easterlin gives more attention to unexpected and puzzling deviations from the secular trends. Comparison of high income nations with lower income nations demonstrates clear differences in a variety of dimensions of social and economic life. Labeling the shift from one group to the other as a social, industrial, or demographic transition implies inherently linear change inconsistent with many patterns of change observed within individual countries during the twentieth century. In contrast, Easterlin explains fluctuations and cycles in behavior rather than unidirectional change. Many find Easterlin's attention to the baby boom—a large deviation from or reversal of the longer-term trend—the most appealing aspect of the theory.

Easterlin similarly contributes to the understanding of social change by constructing a dynamic theory of the impact of age structure. More traditional procedures of demographic accounting focus on the compositional effect of changes in age structure. Assuming a given set of age-specific rates of behavior, a change in the composition of the age structure of the population changes the total rate, as the larger groups contribute more to the aggregate. By assuming that age-specific rates remain constant, such demographic reasoning presents a static depiction of the relationship between societal outcomes and age structure change. Easterlin instead addresses how the age-specific rates of behavior change in response to cohort size. He argues that cohort size changes the likelihood of certain age-specific behaviors, and this makes arguments of behavior change inherently dynamic. In terms of techniques of standardization that divide total change into that due to change in the means (i.e. composition) and change in the rates (i.e. process), Easterlin notes these two components interact in important ways so that changes in means produce changes in rates.

Finally, an important theoretical contribution of Easterlin's work comes from integrating economic and sociological viewpoints. Despite calls for attention to rational decision-making in sociology and institutional factors in economics, the trajectories of the two fields continue to diverge. The different underlying assumptions of economic and sociological models hamper interdisciplinary perspectives. Rather than synthesizing the divergent perspectives or overcoming the incommensurate assumptions, studies more often contrast the relative importance of economic and sociological variables. Easterlin's work exemplifies an exception to this statement. By fusing economic and sociological viewpoints, he attracts interest in both fields.

Like most economists, Easterlin employs a rational choice model in which individuals maximize utility. Such models typically take preferences or tastes as given, but assume individuals and households make rational choices to reach their goals by balancing constraints of price and income with tastes. Easterlin takes a somewhat different economic approach. Still accepting the rational utility-maximizing framework, he argues that income relative to expected income or tastes provides the relevant standard for demographic decision-making. Applied to the problem of fertility, the argument notes that high income alone may not lead to high fertility if the expected standard of living remains even higher. Conversely, low income may lead to high fertility if it nonetheless exceeds low expectations.

Sociologists find the concept of relative income attractive. Relative income comes from the comparison of resources to socially induced tastes or aspirations (Easterlin 1976), and socially induced aspirations stem from childhood economic socialization and experiences. A cohort's taste preferences, formed during adolescence, reflect parental income and persist well into later life, especially into periods of family formation.[4] Value socialization and preference formation thus become a worthwhile topic of study in their own right (Easterlin & Crimmins 1988, Crimmins et al 1991). Sociological concerns with the normative generation of tastes and values fit nicely with the economic reasoning in Easterlin's model.

At the same time, however, by employing both economic and sociological concepts, Easterlin fails to satisfy purists from either discipline. More purely economic explanations focus on longer-term trends in fertility and social behavior that reflect exogenous changes in the cost of children and differential income and work opportunities of men and women (Becker 1991, Butz & Ward 1979, Whittington et al 1990) rather than changes in tastes. Where economists endogenize the cost of children in response to exogenous change in female wages, Easterlin takes relative income status as exogenous and tastes as endogenous. These differences have been the source of considerable controversy over the years (Sanderson 1976, Schultz 1986, Easterlin 1986, Macunovich 1995a).

More purely sociological explanations focus on changes in religious and community values, particularly as they relate to the decline of institutional regulation of individual behavior, as responsible for long-term changes and post-World War II fluctuations in family behavior in high income nations (Westoff 1991, Keyfitz 1991, Inglehart 1990, Lesthaeghe & Surkyn 1988). Values of freedom and individuality contribute to low commitment to family formation and stability, and so reduce ties to social institutions that limit crime, suicide, and alienation. Such theories see demographic and social change as irreversible and noncyclical. In contrast, Easterlin claims economic pressures change ideology and values to fit the financial desires of parents; work and family preferences change in response to economic trends rather than vice-versa, and change proceeds cyclically rather than linearly.

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[4] The focus on tastes suggests individuals act differently when confronted with the same price and resources, and it contradicts typical assumptions of economists (Schultz 1981).

In the long-run, the theoretical importance of the Easterlin effect stems primarily from its fit with empirical findings, a topic to which we now turn.

LABOR MARKET EXPERIENCE AND EDUCATION

Wages

Easterlin gives relative income a crucial mediating role between cohort size and behavioral outcomes. To demonstrate that changes in relative earnings shift with cohort size, Easterlin (1987a:22) compares the median income of year-round, full-time workers at younger and middle ages in 1955 and 1977. The relative income of the young proves smaller in 1977 as the larger baby boom cohorts entered the labor force. A similar pattern emerges for employment rates of the young and the old in 1950 and 1978: the young do worse in the later year (Easterlin 1987a:24). A more detailed time-series from 1968 to 1982 also examines age-income profiles. Again focusing on full-time, full-year workers (to isolate those who depend primarily on income from wages), the time-series compares males ages 25–34 with older males 45–64 (the ages of the parental generation). In 1968, young people belonged to the small cohort born from 1934–1943; in 1982, they belonged to the large cohort born from 1948–1957. As the ratio of income of young males to older males drops steadily (Easterlin 1987a:202, Table 10.1), it corresponds to the trend in cohort size. None of the evidence directly compares parental income with children's later income, but instead contrasts different age groups at the same time period.

More detailed studies of the effect of generational crowding on wages and unemployment support Easterlin, at least until the 1980s. Using micro-level data from the Current Population Surveys, many studies demonstrate that membership in a large cohort during the late 1960s and 1970s harmed wages (Freeman 1979, Welch 1979, Smith & Welch 1981, Berger 1985, 1989, Levy & Michel 1986), but they differ about the degree to which these losses in earnings persist over the life cycle. Welch (1979) and Smith & Welch (1981) argue most strongly that members of large cohorts overcome initially low wages with faster wage growth as the labor force slowly absorbs the large cohort and as individuals make choices about investments in human capital in an attempt to mitigate the negative consequences of belonging to a large cohort. Simulations by Murphy et al (1988) show an initial drop in wages of about 10% for cohorts born at the peak of the baby boom, but lifetime losses amount to only about 3%. Bloom et al (1987) and Dooley (1985) present similar evidence of a diminishing cohort size effect on earnings over the life cycle. Berger (1985, 1989), however, argues that large cohort size continues to limit wage growth substantially throughout one's career.

Another issue concerns which groups within large cohorts face the greatest income loss. Several of the studies demonstrate greater loss among more highly educated persons (Freeman 1979, Smith & Welch 1981, Berger 1989). Stapleton & Young (1984) suggest that the negative effects of cohort size increase with education, because older and younger educated workers are less substitutable for one another than are older and younger less educated or unskilled workers. On the other hand, Falaris & Peters (1991a) argue that higher levels of education may enable members of a large cohort to enter the kinds of jobs and develop the kinds of skills that distinguish them from other members of their cohort, thus mitigating the negative wage consequences.

Whether or not cohort size has an effect on women's wages remains even more a matter of debate. Freeman (1979) found no significant cohort size effects for women. He argues that because women have weaker attachments to the labor force, they choose the kinds of jobs that require less extensive experience. If older and younger women are good substitutes for one another, it will spread the negative wage consequences of an increase in cohort size of young workers across women of all ages. However, as women's labor force attachment has increased over time, this argument has become less relevant. Indeed, several more recent studies show a significant effect of cohort size on women's wages and unemployment rates (Falaris & Peters 1985, Bloom et al 1987, Leveson 1980, Wachter, 1977).

The findings about the negative effects of cohort size on wages have a limited temporal scope. If declining relative income of young persons during the late 1960s to the early 1980s results from entrance of baby boom cohorts into the labor force, relative income of the young should increase in the late 1980s upon entrance of baby-bust cohorts into the labor market. Yet, recent figures updating those presented by Easterlin show a continued decline in relative wages of the young. Table 1 displays the median income of full-year, full-time workers for selected years from 1968 to 1992.[5] The ratio of income of the two age groups reflects relative income. The male ratio in 1992 shows only a slight elevation—the absolute income of young males in constant dollars fell, although not quite as much as that of older males. The female ratio shows no rise at all. As the persons ages 25–34 in 1992 were born from 1958–1967, they include the end of the boom cohorts and only the start of the bust cohorts. We require another ten years of data to adequately examine income of the

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[5] Figures for the first three years come from Easterlin (1987a:202, Table 10.1), while we have gathered data for the three most recent years

Table 1 Median annual wages (in 1967 dollars) by age and sex. selected years

	1968	1975	1982	1985	1989	1992
Males 25–34	7525	7931	6929	6930	6678	6316
Males 45–64	7732	8872	8697	9086	9445	8866
Ratio 25–34/45–64	.973	894	.797	763	.707	.712
Females 25–34	4736	5215	4972	5197	5306	5234
Females 45–64	4473	4904	4927	5251	5617	5699
Ratio 25–34/45–64	1 059	1.063	1.009	.990	.945	918

smaller cohorts born in the late 1960s and 1970s. Yet, thus far, results suggest little evidence of a reversal of recent trends.

More consistent with the logic of the Easterlin effect, some recent evidence shows that wages of young workers with a college degree increased during the 1980s, consistent with the decreased supply of those workers (Murphy & Welch 1992, Katz & Murphy 1992). However, these studies also find that wages of high school graduates and high school dropouts continue to fall. Thus, changes in the supply of male workers could explain the pattern of wages prior to 1980, but a change in the structure of labor demand—in particular, an increase in the demand for more educated workers—better explains wage patterns after 1980.

Others who maintain that the logic of the cohort argument remains valid suggest several reasons for the delay in the beneficial effect on income and wages of cohort size in the 1980s and 1990s. Lilliard & Macunovich (1989) claim that in addition to relative cohort size, earnings respond to whether workers belong to the leading or trailing edge of the baby boom. The leading edge can ameliorate the effects of cohort size fairly quickly, but the trailing edge members must endure economic problems longer until labor market conditions improve. Similarly, recent small cohorts must wait for the bottleneck of the trailing edge of the baby boom generation to work itself out. Although members of the baby bust generation have not yet benefitted from their small cohort size, favorable evidence should emerge in the near future if the relative cohort size argument holds. If, however, demand factors outweigh supply factors, the increase in demand for highly educated workers will continue to depress the wages of less educated younger workers.

The scope of these findings is also limited geographically. Both because of data availability and because of the magnitude of the variations in cohort size over time, the bulk of the research has looked at the United States. However, studies of other high income nations do not always replicate the findings on work and earnings in the United States (Gustafsson 1992). For example, Japan (Martin & Ogawa 1988) and Taiwan (Lin & Chu 1985) show a smaller effect of cohort size on wages than does the United States, perhaps because of their different seniority systems. Great Britain provides inconsistent evidence. Wright (1991) and Ermisch (1988a) find an impact of cohort size on wages and unemployment in Britain, but Ermisch (1988b) suggests rising female labor force participation limits the wage benefits for small cohorts. In France, Riboud (1987) shows that cohort size has little influence on wages. However, the importance of union agreements in many European nations may limit wage adaptation to demographic change (Klevmarken 1993). In a comparative study covering seven countries that experienced major shifts in age structure from 1950–1980, Bloom et al (1987) argue that labor markets face a trade-off between unemployment and wages in responding to large cohorts: The United States shows a strong decline in relative earnings for large cohorts, while other countries show a greater impact on relative youth joblessness. Using a measure of expected wages (i.e. wages multiplied by the probability of employment), they find a significant effect of cohort size for the countries in their study.

Because the connection between cohort size and fertility in Easterlin's theory depends crucially on the intervening effect of cohort size on economic prospects, the fact that recent United States data and international data provide only partial or mixed support for this intervening effect might cast doubt on Easterlin's main hypothesis. However, the observed data on earnings and income of the young may not fully capture the impact of actions individuals take in response to demographic constraints. For example, Welch (1979) and Dooley & Gottschalk (1984) argue that lower earnings decrease the opportunity cost (i.e. make it cheaper) for workers to invest in human capital. This increased investment raises future earnings and allows members of large cohorts to catch up to the earnings levels of smaller cohorts. It also makes the observed net effect of cohort size on earnings smaller than the true full effect that would occur in the absence of mitigating behavior. Focusing on male earnings (or income of full-time workers) better isolates relative income potential than does family income (which includes earnings of other family members). Nonetheless, to the extent that wage levels depend on supply of workers, even earnings may be endogenous. Lacking the ability to adjust for selection, only cohort size remains fully exogenous.

Female Employment

In Easterlin's theory, the impact of relative cohort size on female work and wages differs from that for men. Easterlin contends that the wife's income contribution to the family depends on the relative income of the husband. Membership in a small cohort and high male relative income encourage family decisions that favor childbearing and homemaking over employment for the wife. Low male relative income and adverse male labor market experiences promote female labor force participation as a means of maintaining consumption desires. Given the traditional sexual division of labor in the family, Easterlin claims the work of wives remains secondary to that of husbands.

In support of this view, Easterlin (1987a) holds that trends in relative cohort size better explain the rise in female labor force participation since the 1950s than do other common explanations. He notes that employment of young women stayed low in the 1950s despite many job opportunities, but then rose during the 1960s. The opposite pattern emerged for older women: Their participation rose most in the 1950s when participation of young women declined. Wachter (1977) shows that these changes correspond closely to changes in male relative income. If demand or ideology explains changes in female participation, we would expect to have seen similar changes among younger and older women.

Leveson (1980) finds evidence in support of the secondary worker effect on female employment. Cohort size generally has a positive rather than a negative relationship with employment for women. The exception, where the relationship proves negative rather than positive, comes at younger ages. Before marriage, the labor market behavior of women in large cohorts resembles that for men, but after marriage it counteracts male labor force behavior (Leveson 1980). Schapiro (1988) finds that rising cohort size increases female labor force participation for women ages 25–34 (but, again, not for younger women ages 20–24). Robertson & Roy (1982) demonstrate the same relationship in Canada. Related work that looks at family labor supply decisions over the business cycle finds that wives are more likely to enter the labor force when their husbands become unemployed. The evidence shows, however, a fairly small effect (Lundberg 1985).

Oppenheimer (1976, 1982) argues that more permanent changes in female labor force attachment were in part induced by the baby boom itself. She presents evidence that the high costs of raising teenage baby boomers and funding their college expenses pushed many mothers of baby boomers into the labor force. This maintained family income standards during the children's crucial adolescence, when they formed their consumer aspirations. High aspirations in turn contributed to the relative disadvantage of baby boomers as young couples, and raised female labor force participation rates. All future cohorts, on the basis of husband's income alone, will likewise face economic hardship relative to the combined income of their mothers and fathers. Therefore, female employment will remain high rather than fluctuate (Oppenheimer 1976, 1982).

Others note that labor force participation rates for married women have been rising steadily since the 1900s, and they suggest that rising female wages help explain both the long-term trend and the patterns since 1950. Work in the area of the new home economics argues that higher female wages increase the cost of not working and raise the cost of children regardless of cohort size (Butz & Ward

1979). Thus, an increase in female wages can have both a direct impact on labor supply by making it more attractive to work in the market and an indirect impact by reducing the number of children and decreasing the costs of working. Cross-sectional studies almost universally find that the positive effect of women's wages on participation dominates the negative effect of husband's income (see Killingsworth 1983 for a review of these studies). Using time-series data on married women's labor force participation since 1900, Goldin (1990) concludes that before 1950 the negative effect of husband's income was more important, but after 1950 the positive effect of women's wages dominated. Another time-series study by Smith & Ward (1985) finds that wages of both men and women have risen throughout the twentieth century, but that the wage opportunities for married women have increased much faster (starting from a lower base) than those for men. Smith & Ward (1985:S60) conclude that "the combined effect of rising male and female wages explains almost 60% of total growth in the female labor force [from 1950–1980]. Fully half of this reflects the effects of wages as transmitted through fertility."

Ideological changes that occur independently of cohort size can have similar consequences. If women desire work for social or normative reasons, this will sever the link between husband's income and wife's labor force participation. Perhaps as a result, Easterlin's theory explains the pattern of growth rates in recent years less well than in the past. For example, the growth in participation rates of women under 35 continued through the 1980s (US Bureau of the Census 1993:395).

A potential reversal in these trends, a reversal consistent with Easterlin's prediction, may be emerging among young women ages 20–24. Fair & Macunovich (1993) find that relative cohort size affects labor force participation for this age group through the mediating effect of wage levels. Their model forecasts declining participation in the labor force among young women in the years to come.

Educational Attainment

Cohort size may influence educational experiences both directly and indirectly through potential labor market opportunities. The direct influence comes simply from the fact that larger cohorts face excessive crowding and poorer quality in their schooling. Further, since parental contributions to college costs must be split among a larger number of children, members of large cohorts face more difficulties in gaining the necessary economic support. According to Easterlin, then, smaller cohorts acquire higher levels and quality of schooling than larger cohorts. The indirect influence of cohort size stems from its effect on the rate of return that education provides (i.e. the wage differential between one level of education and the next higher level) and thus on the incentive for individuals to attain more education.

Literature on the trends in educational enrollment generally supports Easterlin. Ahlburg et al (1981) found that increased cohort size reduces the college enrollment rate (net of the upward secular trend), and they predicted increasing enrollment during the period after 1977 as cohort size declines. Since secular trends would increase college enrollment anyway (Russell 1982), one needs to compare the educational experiences of the baby boom and baby bust in relative terms. Accordingly, the model of Schapiro & Easterlin (1981) predicts that male educational attainment will increase faster from 1980–2000 than it did from 1960–1980. More controversially, they also predict that female enrollment will decline as male wages and educational enrollment rise.

With more recent data, Stapleton & Young (1988) demonstrate that the male college completion rate (bachelor degrees as a ratio to the number of persons age 22) fell steeply during the 1970s as the peak of the baby boom reached college age. Their figures suggest an upturn as of 1980 as the baby bust generation begins college. Female completion rates, in contrast, fluctuate less than for males during the time period. Other figures show the percentage of males ages 18–21 enrolled in college went from 35.4 in 1975 to 40.1 in 1991, and the percentage of females enrolled at the same ages went from 31.8 to 44.2 (US Bureau of the Census 1993:169). Macunovich (1993c) attributes this rising college enrollment to smaller cohort size and the increasing wage gap between college graduates and nongraduates.

Other literature more directly examines the effect of cohort size on the returns to education. The empirical work examining this effect is less extensive than work relating cohort size to wage levels and has reached less consensus. Still, several studies have found that negative consequences of being born in a large cohort are greater for those with a college education. In addition, the rate of return to a college education in the United States began to fall during the early 1970s for cohorts born about 1950—the middle of the upswing of the demographic cycle. Rates of return reversed their downward trend and began to increase about 1980 for cohorts born just past the peak of the baby boom (Ehrenberg 1994). Not only did returns to a college education increase for recent labor market entrants, but they also rose for individuals from older (and larger) cohorts who had earlier obtained a college degree (Murphy et al 1988).

Returns to education may also vary within cohorts. Stapleton & Young (1988), noting that college educated workers bear the negative consequences of being born in a large cohort much more than do less educated workers, suggest that those born at the peak of the baby boom have less incentive to obtain a college education. However, their model explicitly recognizes that large cohort size per se matters less than the size of the cohort relative to preceding and subsequent cohorts (i.e. one's position in the demographic cycle of leading edge, peak, and trailing edge).

Wachter & Wascher (1984) explain the same trends with a different argument that also explicitly recognizes different incentives for those born during the leading or trailing edge of a cohort cycle. Members of the leading edge have high enrollment rates because they desire to finish schooling and enter the labor market quickly, before the peak of the cycle enters the labor market. Members of the trailing edge slow their education to enter the labor market after the peak of the large cohort has already entered the labor force. This has the effect of leveling the peaks and troughs of school enrollment rates due to demographic cycles, and it explains high enrollments in the late 1960s and declining rates in the 1970s (Wachter & Wascher 1984).

In contrast, Falaris & Peters (1991a, 1991b) present evidence that men and women born during the upswing of the demographic cycle obtain more schooling and enter the labor force at later ages than those born during the downswing of the demographic cycle. This evidence suggests that the higher (or lower) enrollment rates of those born during the upswing (or downswing) of the cycle reflect higher (or lower) educational attainment and longer (or shorter) durations in school for those cohorts. They find similar, albeit weaker, patterns for women than for men, a fact which contradicts predictions of Schapiro & Easterlin (1981).

Although the evidence about the relationship between cohort size and the rates of return to education remains sketchy, and none of the theories developed so far is entirely consistent with that evidence, the literature suggests two common themes. First, cohort size does affect the rates of return to education, although likely in ways more complex than those specified by Easterlin. Second, the educational choices that individuals make may mitigate the negative consequences of being born in a large cohort, a point which echoes themes in Easterlin's recent work.

FAMILY BEHAVIOR

Marriage and Divorce

According to Easterlin (1987b), the economic pressure and low relative income of men in a large generation make it harder for them to fulfill traditional obligations of the male family role. Marriage rates are lower among large cohorts as part of the process of sacrificing family roles to close the gap between income and aspirations. Among those who marry, low relative income increases marital strains and divorce.[6] Carlson (1980) adds another twist to the argument: Poor socialization of large cohorts makes performance of traditional family roles more difficult.

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[6] By contributing to more single-parent families and to low wages of young parents, poor labor market opportunities may increase the poverty rate among children (Easterlin 1987c). At the same time, however, demographic adjustments to poor economic status in the form of lower fertility, increased female labor force participation, and household sharing may contribute to the economic well-being of children (Macunovich & Easterlin 1990).

The limited evidence that exists provides some support for the predictions with regard to the divorce rate, but not to the marriage rate. Preston & McDonald (1979) show that deviations from the secular trend in cohort divorce relate to measures of relative income. Easterlin (1987a) similarly demonstrates that lower than expected divorce rates from 1945–1965 and higher than expected rates thereafter correspond to changes in relative income. In a time-series regression analysis, Schapiro (1988) finds that relative cohort size predicts the divorce rate, but not the marriage rate. At the individual level, MacDonald & Rindfuss (1981) find with longitudinal data that own income, but not parental or relative income, affects family formation.

Fertility

Most studies of the Easterlin effect focus on marital fertility. Crucial evidence in favor of the Easterlin effect comes from the remarkable correspondence between relative cohort size and fertility for the United States from after World War II to 1980 (Easterlin 1987a:51). Ahlburg (1982) demonstrates bivariate relationships between age structure and relative income, and between relative income and the crude birth rate during the post–World War II period. Similarly, as predicted by the cyclical model, Ahlburg (1983) finds that birth rates 20 years earlier predict later birth rates during the post–World War II period.

Do the effects of relative cohort size prove similarly large net of other variables? Wachter (1975) finds effects of relative cohort size on annual times series in the United States, as do Shields & Tracy (1986). Using different aggregate data, Lindert (1978) shows that prior economic experience affects later fertility at the state level in the pre-World War II United States. Other studies find less support. Butz & Ward (1979) show some impact of relative cohort size in the United States, but an impact that is less important than female wages. Kelly & Cutright (1984) find no effect of relative cohort size on yearly changes in fertility in the United States.[7] With controls for female work and wages, Ermisch (1979, 1980) finds weak support for the effect of relative cohort size on fertility in Great Britain and West Germany. All these results are subject to the proviso that relative cohort size may still have important total effects even if it does not have large direct effects net of female wages and work. Controls for female labor force participation and wages, which are in part themselves determined by relative cohort size, may hide the causally prior effect of relative cohort size.

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[7] In response to Rutten & Higgs (1984), Easterlin (1984) notes that relative cohort size may not change year to year in the same direction as fertility changes, but over the longer-term swings represented by the baby boom and baby bust, they correspond closely.

The analysis of census data by Rindfuss & Sweet (1977; Sweet & Rindfuss 1983) contradicts the predictions of the Easterlin effect, although they employ no measure of relative economic status. They find that similar national period fertility trends have occurred within the racial, ethnic, and social groups they examined. Since economic status likely varies across these groups, one might expect divergence in period trends. Although aggregate period fertility rates match trends in relative cohort size, more disaggregated data do not.

Other studies that attempt to disaggregate period rates into cohort, age, and period components also fail to support Easterlin. Smith (1981), Wright & Maxim (1987), and Pullum (1980) all show little effect of cohort net of age and period. However, Easterlin (1987b:2) suggests that cohort experiences may affect more than the fertility of the cohort alone: "because of what might be termed 'social contagion,' the impact of cohort size is not necessarily confined to a given cohort ... [and] ... interdependence among age groups would undermine an attempt to distinguish cohort from age effects by purely statistical means." Thus, the positive or negative experiences of youth entering the labor market may shape the perceptions of other cohorts of childbearing age and explain the common period trends among subgroups that Rindfuss & Sweet (1977) identify.[8]

Analysis of individual data supports the Easterlin hypothesis much less often than does aggregate time-series data. For example, subjective measures of relative economic status poorly predict fertility. MacDonald & Rindfuss (1978) and Thornton (1978, 1979) detect no evidence (or inconsistent evidence, in the case of Oropesa 1985) of the influence of such variables on fertility for cross-sectional samples of couples. With longitudinal data, Crimmins-Gardner & Ewer (1978) find wife's subjective evaluation of relative economic status (but not husband's as one might expect) relates to fertility. Even at that, the effect proves small. Perhaps any subjective measure will fail to reflect accurately the objective circumstances of men and women making fertility decisions, and use of such data fails to provide a meaningful test of the theory (Macunovich 1995a).

Cross-sectional data on individuals present another problem for Easterlin's theory. His argument that high income persons feel relatively deprived and low income persons feel relatively well-off explains the well-known negative correlation between income and fertility, but has implausible implications. As Sanderson (1984) points out, if the poor are relatively less deprived, they should have lower illegitimacy, divorce, and crime—a claim the data contradict (see also Jencks 1981).

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[8] This discussion leads back to debates over the value of period and cohort measures of fertility. In reviewing the history of the debate, Bhrolchain (1992) claims the bulk of the evidence supports a period approach.

None of the previously listed studies directly measures parental income. The difficulties in such an exercise lead some (e.g. Preston 1982) to view the Easterlin effect as inherently macrosociological. Those who desire individual-level tests must develop creative models and data samples. One strategy controls for parental income by examining twins who shared the same parental income and therefore would develop the same expected standard of living (Olneck & Wolfe 1978). They find sibling income differences among the twins have little relationship to fertility differences. Behrman & Taubman (1989, 1990) also measure income of parents and children with a sample of twins and their adult offspring. The authors note that both Easterlin and Becker (1991) predict—based on entirely different theoretical arguments—the inverse relationship between fertility of first and second generations observed by Ben-Porath (1975). However, employing a complex model that distinguishes the empirical implications of the two arguments, they find ultimately that Easterlin's model seems more consistent with the data.

Of the individual-level studies, only Moffit furnishes evidence in favor of the Easterlin effect.[9] Moffit (1982) claims that studies at the individual-level (and perhaps as well at the aggregate level) are flawed by the failure to consider lifetime flow of income of parental and childbearing generation. By constructing a lifetime income profile using synthetic cohort data from the Current Population Survey, he finds parental lifetime income reduces fertility while own lifetime income increases fertility.

Most of the aggregate and individual-level research focuses on the pre-1980 period. Easterlin bravely and provocatively predicted in the 1970s that fertility would rise as relative cohort size falls. According to the original statements of the theory, a fertility rebound should have occurred by now (Olsen 1994). Yet, since 1980, the correspondence between fertility and relative cohort size in the United States and Canada has disappeared (Pampel 1993, Abeysinghe 1991). In other words, the small cohorts entering adulthood in the 1980s and 1990s show little indication of generating their own baby boom. Figure 1 compares the trend in the general fertility rate up to 1993 with the trend in relative cohort size.[10] Assuming a short lag in the effect of cohort size, the trends match closely from 1945 to 1980, but diverge afterward. We see a slight upward shift in fertility in the early 1990s, but nothing similar in size to the decrease in relative cohort size.

Easterlin (1987a:156) has revised his predictions downward, given societal

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[9] Note, however, that Moffit only uses individual data to construct synthetic cohort measures of lifetime income. The fertility analysis then exploits variation in the time-series rather than cross-sectional data.

[10] Figure 1 presents the reciprocal of relative cohort size (i.e. males 30–60 as a ratio to males 15–29) which corresponds directly rather than inversely to fertility.

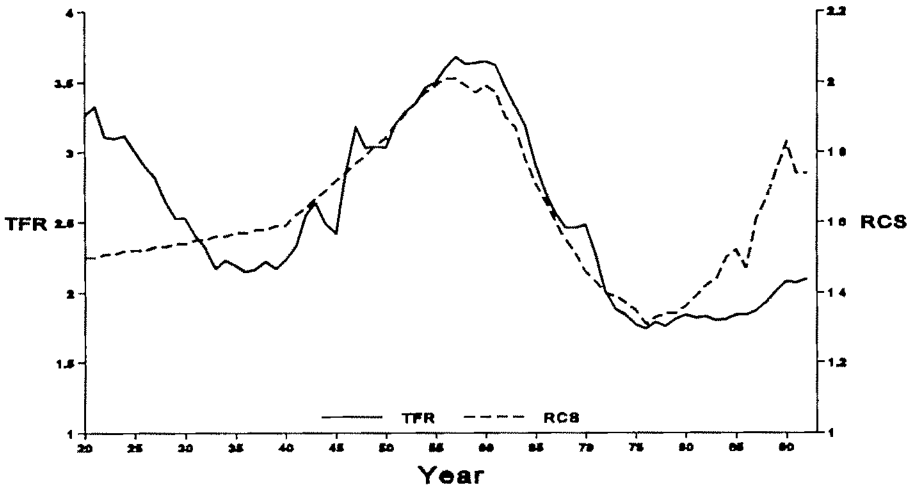

Figure 1 Total fertility rate and relative cohort size, United States, 1920–1992

changes in the 1980s and 1990s, but he still expects the total fertility rate to rise above the replacement level as members of the baby bust cohort fully reach child-bearing age. As the youngest members of the baby-bust cohorts have just now reached their teens, fertility can still yet rise in the next 10–20 years as these younger members age through the childbearing years. Easterlin (1992) reminds us that predictions of future fertility based on extrapolation of recent trends have, in the past, failed badly. The projection of below replacement rate fertility made in the late 1980s may again fail to capture important swings in fertility. Indeed, the total fertility rate in 1992 has already reached the replacement level unexpected only a few years ago. Moreover, Macunovich's (1995b) study of marriage, divorce, and fertility among young women ages 20–24 finds an increase in family formation that may foretell larger increases as these young cohorts grow older. Thus, results supporting the predictions may emerge, albeit years after they were originally expected.

Assuming future fertility does not rise substantially in the near future, one may take the counter-evidence as falsifying the theory. Having made clear and bold predictions that the data fail to support, the theory by rights must be rejected, and scholars should proceed to search for alternative theories. Whatever correspondence existed in the past between relative cohort size and fertility may be viewed as coincidental or spurious. Supporting this conclusion, many scholars dismiss the importance of the Easterlin effect.

A conclusion more charitable to the theory notes that the conditions necessary for the Easterlin effect to emerge have been compromised, which at least temporarily mutes the expected cycle. Applying those general conditions necessary for the Easterlin effect to emerge to the late 1980s and early 1990s suggests reasons for the divergence of relative cohort size and fertility. First, the business cycle may have emerged as more important than the supply of workers in recent decades. The economic recession of the early 1980s was more severe than those in the previous decades, and the recession of the early 1990s lasted longer than those typical of the 1950s, 1960s, and 1970s. Even if small in size, cohorts of young people find few jobs opportunities in such an economic environment.

Second, legal (and likely illegal) immigration into the United States more than doubled during the 1980s compared to the 1960s (US Bureau of the Census 1993:10). When present in sizable numbers, immigrants compete for jobs with native-born baby-bust cohort members and so curb the emergence of a labor shortage.[11]

Third, changes in sex-role orientations may more permanently and drastically change the nature of fertility decision-making of couples. In the short run, career problems created for women by entrance to and exit from the labor force warrant more permanent attachment and reduce the importance of male income to fertility decisions. Further, higher wages for women might modify the effect of cohort size. When women's wages are high, the importance of men's relative income diminishes—women's potential loss of high wages from childbearing reduces the weight men's relative income gets in household decision-making. In the long run, women's work disrupts the expected cycle of aspirations and resources. High levels of labor force participation of women reflect the adjustments of baby-boom families to low potential male income; such adjustments may have kept the standard of living expected of their children high (Easterlin, Macdonald, & Macunovich 1990a, 1990b). Members of the baby-bust generation were thus raised in better economic circumstances than might have been expected if their mothers did not work so much, and they may have thus developed relatively high expectations (Easterlin & Crimmins 1991).

Fourth, the extraordinary size of the baby-boom generation may have had lingering effects on hiring of younger workers. As businesses in the 1990s reduced costs by shedding workers, they have had to adjust for excess older workers with fewer hires of younger workers. In some ways, employers find older male workers more substitutable for younger workers than in the past. The opposite may hold for women: Committed to long-term careers, younger and older women may become less substitutable as men become more substitutable.

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[11] High rates of immigration may have also muted the potential for an echo baby boom in the 1980s in Israel (Ben-Porath 1988).

Finally, regardless of the time period, we note less support for the Easterlin effect in nations other than the United States. Easterlin & Condran (1976) apply arguments about relative cohort size to Australia, Canada, and England and Wales, finding results similar to those for the United States. Robertson & Roy (1982) and Ahlburg (1986) find effects of relative cohort size on fertility and evidence of fertility cycles for Canadian time-series. That these English-speaking nations with liberal political traditions all show similar demographic relationships might suggest that something common in their sociocultural background proves important for the results. Studies of more diverse sets of high income nations show less supportive evidence. Baird (1987) finds effects for the United States and France, but not Sweden and England-Wales. O'Connell (1978) finds a negative relationship between changes in the number of men ages 20–34 and the age-standardized fertility rate for 10 countries and a positive or zero relationship for four countries. Less complete support comes from the study of European nations only. Chesnais (1983) finds the expected relationship for only 2 out of 18 European nations, and Wright (1989) finds the expected relationship for only 5 out 20 nations. A detailed analysis of trends 'in Netherlands by de Beer (1991) shows that the Easterlin effect emerges, but is not dominant. Artzrouni & Easterlin (1982), while finding generally positive effects of relative cohort, nonetheless demonstrate many differences between countries. Overall, Wright (1989) concludes that the Easterlin model meets with little success outside the United States (or, we might add, in non-European English-speaking nations).

Pampel (1993) attempts to make sense of the cross-national divergence by arguing that the sociopolitical environment may facilitate or inhibit the effect of cohort size. Nations with national systems of collective social protection, which limit the effects of unemployment through labor market policies and generously support those out of the labor force, can be expected to experience smaller effects of cohort oversupply on behavioral outcomes than more individualist nations.

As conditions for the operation of the Easterlin effect multiply, the power of the theory declines. Indeed, one can suggest that the conditions themselves prove more important than relative cohort size. Female wages, sex-role norms, changing family values, and continued poor economic performance all offer competing explanations of continued low fertility. Rather than treating the alternatives as competing, however, another approach would attempt to integrate the theories. Instead of including multiple variables as additive (and competing) determinants in the same equation, the level of one can influence the level of the other, such as in the work of Macunovich (1993a,b).

SOCIAL DISORGANIZATION: CRIME, SUICIDE, ALIENATION

Easterlin argues that low relative economic status translates into mental stress. Men suffer either from economic deprivation or from the inability to fulfill some traditional male roles when they sacrifice family goals for consumer aspirations. The resulting stress can lead to excess drug and alcohol use, crime, suicide, and institutional alienation. A more structural version of the argument predicts similar outcomes. Weak ties among members of a large cohort to the labor force, traditional family roles as husband and father, and other age groups make them more likely to act in harmful ways. Especially among youth, large cohorts may become insulated from the larger society, which exacerbates rebellious behavior.

Studies of the Easterlin effect on aspects of social disorganization face two difficulties. First, most studies examine national levels of homicide, suicide, or crime. Age structure has a clear compositional effect on aggregate rates, but the Easterlin effect requires analysis of age-specific data (as for fertility, unemployment, labor force participation, marriage, and divorce). Yet, age-specific data on criminal behavior are difficult to obtain. Researchers typically rely on arrest rates by age, which reflect police and reporting behavior as well as actual criminal behavior, or on age-specific data on homicide victims, which focus on characteristics of the victims rather than the perpetrators. Second, numerous other trends contribute to rising levels of these indicators of social disorganization. So many other changes occurred in the 1960s that it is difficult to isolate the effect of relative cohort size.

Easterlin (1987a) presents some crude evidence of the relationship between homicide victimization among the young (assuming ages of victims and perpetrators are similar). Homicide rose in the 1960s in part because of compositional changes in the population due to the growth into adolescence of the baby boom generation. In addition, homicide rates of males 15–24, which control for age, still grew in the late 1960s into the late 1970s. In other words, growing homicide among the young corresponds to their large cohort size. As would be expected from such results, Easterlin & Schapiro (1979) find homicide correlates closely with fertility in the United States because both respond to relative cohort size.

To test if the relationship between cohort size and homicide (and other crime) is spurious, researchers use age and period- specific arrest rates and statistical techniques to separate out the net effects of cohort size from age and period. As mentioned earlier, separating net cohort effects presents conceptual as well as statistical problems. If time-series analysis provides a generous test of the effect of relative cohort size, age-period-cohort analysis provides a severe test.

With this point in mind, we can classify the studies of crime into supportive and non-supportive groups. The supportive studies include Maxim's (1985) analysis of juvenile delinquency, O'Brien's (1989) study of arrests for crimes of property and violence (the former relates more to cohort size than the latter), and Smith's (1986) study of arrests for homicide. Unlike these and most other studies, Menard & Huizinga (1989) and Menard & Elliot (1990) avoid the use of official arrest data. With longitudinal survey data from 1976–1983, they measure self-reported alcohol and drug use among young people, but must limit the analysis to a brief time-span and set of cohorts. They nonetheless find net effects of cohort size for most of their dependent variables.[12]

The nonsupporting studies come from work by Steffensmeier and colleagues. Their earlier analysis (Steffensmeier et al 1987) shows no net influence of cohort size on arrest rates. A later analysis (Steffensmeier et al 1992) finds cohort size has positive effects on arrests of the young, but the effects are trivial — explaining less than 1 percent of the variance in arrest rates. They conclude the Easterlin framework has little utility for explaining periodicity in social phenomena. However, both studies classify cohorts by single years of age (and interpolate when arrest rates are grouped by five-year age categories). As single-year fluctuations may not be large enough to create problems in labor market crowding, high fertility for several consecutive years and multi-year cohorts may be needed to asses the Easterlin effect.

Easterlin provides evidence for the influence of relative cohort size on suicide rates similar to that for homicide. Suicide rates among males 15–24 declined during the 1950s and rose during the 1960s and 1970s just as the relative number of young adults declined and then rose. In contrast, suicide rates among males 45–54 fell during the 1960s and 1970s as their proportion in the population fell.

Ahlburg & Schapiro (1984) offer a more formal multivariate test of the effect of relative cohort size on age-specific suicide from 1948–1976. They find that a relatively high ratio of young to middle-aged men raises suicide for young males, lowers suicide for the middle-aged males, and has little effect on suicide of females (with controls for divorce rates, fertility rates, labor force participation rates, income, and employment opportunities). Less sophisticated bivariate studies further show a relationship between cohort size and suicide. Holinger et al (1988) find a positive correlation between cohort size and suicide among the young, but not among the old, for the United States; Lester (1991) finds similar effects in a study of Japanese suicide rates. None of these studies, however, attempts to identify separate age, period, and cohort effects on suicide. Even with the detailed period controls in Ahlburg & Schapiro (1984), the possibility of spuriousness remains.

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[12] Because their data cover a relatively small number of birth cohorts, Menard and colleagues more thoroughly examine the effects of number of siblings on deviant behavior. They argue that a large number of siblings reflects less adequate socialization, which in turn increases problems in school and family isolation (Elliot et al 1989). This variation on strain theory is quite consistent with Easterlin's arguments (Menard 1992).

These studies of homicide and suicide focus primarily on the period for which the Easterlin effect best applies—the post-World War II years up to 1980. Do the trends for young people since then fit the prediction that homicide and suicide should decline as members of the small baby-bust cohorts enter youth and young adulthood? As we noted earlier, the question has no simple answer because so many other forces besides cohort size affect these behaviors. Homicide death rates among males 15–24 (presumably reflecting perpetrators of similar age and gender) declined from 1980 to 1985, but then rose in the late 1980s and early 1990s. Suicide rates for males ages 15–24 rose more steadily and continuously during the 1980s, albeit not as much as they rose in the 1960s and 1970s. Table 2 presents these figures for selected years. In fact, the figures show that the advantage of the younger group in numbers of suicides relative to the older age group has nearly disappeared. Although one can offer alternative explanations for the recent increases in homicide and suicide among the young, the simple evidence thus far fails to demonstrate the expected Easterlin effect.

A final example of the methodological basis of divergent conclusions over the Easterlin effect comes from two studies of political alienation. Easterlin (1987a) notes alienation declined during the 1950s and rose during the late 1960s and 1970s. Like crime and suicide, these trends match those in relative cohort size. Yet, such correspondence fails to establish a causal relationship, which makes it necessary to control for age and period. Kahn & Mason (1987)

Table 2 Homicide and suicide rates, trends for males, 1946–1990

	Males 15–24		Males 45–54
Year	Homicide	Suicide	Suicide
1946	12.2	7.4	30.3
1950	9.6	6.5	32.0
1955	8.5	6.3	29.7
1960	9.1	8.2	31.6
1965	10.7	9.4	29.1
1970	19.0	13.5	27.9
1975	21.2	18.9	27.9
1980	24.5	20.2	22.9
1985	18.9	21.4	23.5
1990	32.9	22.0	23.2

and O'Brien & Gwartney-Gibbs (1989) reach opposite conclusions in their analyses of consecutive cross-sectional election year surveys, primarily because of their different model specifications. Kahn & Mason allow age and relative cohort size to interact, arguing the effects of relative cohort size should be especially strong for the young. They find little influence of cohort size. O'Brien & Gwartney-Gibbs, claiming that cohort effects last throughout the life cycle, find clear additive effects that the collinear interactions hide. The response of Mason & Kahn (1989) justifies theoretically their interactive specification, but the support Easterlin receives from O'Brien & Gwartney-Gibbs's more parsimonious model deserves special weight.

CONCLUSION

The evidence for the Easterlin effect proves mixed at best and plain wrong at worst, but beyond this perhaps already obvious conclusion, we can specify more carefully the type of data for which the effect emerges most strongly and the kinds of behaviors to which the effect best applies. In brief, aggregate data support the hypothesis more than individual-level data, period-specific or time-series data support the hypothesis more than cohort-specific data, experiences from 1945–1980 support the hypothesis more than the years since 1980, and trends in the United States support the hypothesis more than trends in European nations. Given these data qualifications, the predictions of the Easterlin effect best fit aggregate, period trends from 1945–1980 in the United States. The conceptual broadness of the phenomena potentially explained by the theory represents a strength, but the empirical evidence does not extend as far as the theory suggests.

Our review of the evidence falsifies an overly general and unqualified version of the Easterlin effect. Critics rightly focus on the inability to confirm the individual motivations behind the aggregate trends specified by Easterlin, the absence of strong cohort effects independent of period and age, the failure to extend beyond one full cycle to apply to the 1980s and 1990s, and the lack of geographic generality. Moreover, the crucial intervening concept of relative income proves hard to measure independent of cohort size, making it possible that links between cohort size and demographic behavior reflect spuriousness. The countering influence of factors other than cohort size makes it difficult to use recent trends to dismiss the Easterlin effect (one can always say the contradictory trends would have been even larger if not for cohort size). Nonetheless, the negative evidence means the theory does not have the power and consistency hoped for by many when the theory was first developed.

At the same time, however, a crucial piece of evidence is hard to dismiss. The match between relative cohort size and fertility up to 1980 is remarkable. Something more than coincidence seems necessary to account for this correspondence. Further, wage levels of older and younger men closely followed cohort size. The divergent experiences of young people in the 1950s and 1970s in the areas of work, family, and deviance fit Easterlin's arguments. Further, evidence of possible reversals in trends in fertility, education, female labor force participation, marriage, and divorce suggests we cannot dismiss a delayed reemergence of the Easterlin cycle.

Our approach to make sense of the divergent evidence has been to emphasize the contingent nature of the Easterlin effect. A careful review of Easterlin's arguments highlights a number of conditions necessary for relative cohort size to emerge as the dominant determinant of relative economic status and resulting demographic behavior such as fertility. Our review of these conditions suggests that the Easterlin effect applies to the United States and a few other (almost always English-speaking) countries that experienced not just a postwar increase in fertility, but a notable baby-boom. The conditions responsible for such an outcome appear unusual rather than general (as the 1950s represent an unusual deviation from, and the 1960s represent a dramatic return to, the longer-term trends in demographic behavior). They do not yet extend into more recent periods nor apply to many other countries for the reasons we specify in the paper.

One also has to make allowances for the failure of individual-level and cohort-specific data to support the theory to the same extent that the period data does. Cohort has some relevance to demographic behavior, but the actual subjective reference groups used to make decisions seem much more complex than specified by the theory. Easterlin's model of taste formation needs to better specify the mechanisms through which relative income affects aspirations, and to derive implications from the theory testable in the cross-section. Finally, women's role in providing income likely involves more than responding to high or low relative male income. A revised argument focusing on changes in cohort size of men and women also deserves attention in the future.

Rather than simply reject or accept the Easterlin effect as the dominant determinant of demographic trends, the conditional interpretation we offer of the evidence suggests relative cohort size be incorporated into integrated economic and sociological theories. Important changes in female wages emphasized by economic theories may interact with changes in cohort size. Similarly, values involving women's role in the economy and family size may specify the conditions necessary for the Easterlin effect to emerge. Broader theories that emphasize, to the extent possible, the combined influences of various forces could include what remains valuable in the Easterlin effect.

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Literature Cited

Abeysinghe T. 1991. On testing Easterlin's hypothesis using relative cohort size as a proxy for relative income: an analysis of Canadian men. *J. Popul. Econ.* 4:53–69

Ahlburg DA. 1982. The new Kuznets cycle: a test of the Easterlin-Wachter-Wachter hypothesis. *Res. Popul. Econ.* 4:93–115

Ahlburg DA. 1983. Good times, bad times: a study of the future path of U.S. fertility. *Soc. Biol.* 30:17–31

Ahlburg DA. 1986. A relative cohort size forecasting model of Canadian total live births. *Soc. Biol.* 33:51–56

Ahlburg DA, Crimmins EM, Easterlin RA. 1981. The outlook for higher education: a cohort size model of enrollment of the college age population, 1948–2000. *Rev. Public Data Use* 9:211–27

Ahlburg DA, Schapiro MO. 1984. Socioeconomic ramifications of changing cohort size: an analysis of U.S post-war suicide rates by age and sex. *Demography* 21:97–108

Artzrouni MA, Easterlin RA. 1982. Birth history, age structure, and post-World War II fertility in ten developed countries: an exploratory empirical analysis. *Genus* 38:81–99

Baird AJ. 1987. A note on the Easterlin model of fertility in Northwestern Europe and the United States:1950–1981. *Int. J. Comp. Sociol.* 28:57–68

Becker GS. 1991. *A Treatise on the Family.* Cambridge MA: Harvard Univ 424 pp.

Behrman JR, Taubman P. 1989. A test of the Easterlin fertility model using income for two generations and a comparison with the Becker model. *Demography* 26:117–23

Behrman JR, Taubman P. 1990. A comparison and latent variable test of two fertile ideas. *J. Popul. Econ.* 3 19–30

Ben-Porath Y. 1975 First generation effects on second-generation fertility *Demography* 12:397–405

Ben-Porath Y. 1988. Market, government, and Israel's muted baby boom. See Lee et al 1988, pp. 12–38

Berger MC. 1985. The effect of cohort size on earnings growth: a reexamination of the evidence *J. Polit. Econ.* 93:561–73

Berger MC. 1989. Demographic cycles, cohort size, and earnings. *Demography* 26:311–21

Bhrolchain MN. 1992. Period paramount? a critique of the cohort approach to fertility. *Popul. Dev. Rev.* 18:599–692

Bloom DE, Freeman RB, Korenman SD 1987. The labour-market consequences of generational crowding. *Eur. J. Popul.* 3:131–76

Butz WP, Ward MP. 1979. The emergence of countercyclical U.S. fertility. *Am Econ. Rev.* 69:318–28

Carlson E. 1980. Divorce rate fluctuation as a cohort phenomena. *Popul. Stud.* 33:523–38

Carlson E. 1992. Inverted Easterlin fertility cycles and Kornai's "soft" budget constraint. *Popul. Dev. Rev.* 18:669–88

Chesnais JC. 1983. La notion de cycle en démographie. La fécondité post-transitionelle, est-elle cyclique? *Population* 38:361–90

Crimmins EM, Easterlin RA, Saito Y. 1991. Preference changes among American youth: family, work, and goods aspirations, 1976–86. *Popul. Dev. Rev.* 17:115–33

Crimmins-Gardner EM, Ewer PA. 1978. Relative status and fertility. *Res. Popul. Econ.* 1:247–59

de Beer J. 1991. Births and cohort size. *Soc. Biol.* 38:146–53

Dooley MD. 1985. *Changes in the relationship among earnings, education, and age for Canadian men:1971–1981. Work. pap. no. 85–17,* Dep. Econ., McMaster Univ., Hamilton, Ontario

Dooley MD, Gottschalk P. 1984. Earnings inequality among males in the United States: trends and the effect of labor force growth. *J. Polit. Econ.* 92:59–89

Easterlin RA. 1961. The American baby boom in historical perspective. *Am. Econ. Rev.* 51:869–911

Easterlin RA. 1968. *Population, Labor Force, and Long Swings in Economic Growth: The American Experience.* New York: Natl. Bur. Econ. Res 298 pp

Easterlin RA. 1971. Does human fertility adjust to the environment? *Am. Econ. Rev.* 61:399–407

Easterlin RA. 1973. Relative economic status and the American fertility swing. In *Family Economic Behavior,* ed. EB Sheldon, 1:170–223 Philadelphia: Lippincott. 418 pp.

Easterlin RA. 1976. The conflict between aspirations and resources. *Popul. Dev. Rev.* 2:417–26

Easterlin RA. 1978. What will 1984 be like? Socioeconomic implications of recent twists in age structure. *Demography* 15:397–432

Easterlin RA 1984. Reply to Rutten and Higgs. *Res. Popul Econ.* 5:213–15

Easterlin RA. 1986. Economic preconceptions and demographic research: a comment. *Popul. Dev. Rev.* 12:517–28

Easterlin RA. 1987a. *Birth and Fortune: The Impact of Numbers on Personal Welfare.* Chicago: Univ Chicago. 228 pp. 2nd ed.

Easterlin RA. 1987b. Easterlin hypothesis In *The New Palgrave: A Dictionary of Economics,* ed. J Eatwell, M Milgate, P Newman, 2:1–4. New York: Stockton

Easterlin RA. 1987c. The new age structure of poverty: Permanent or transient? *Popul. Dev. Rev.* 13:195–208

Easterlin RA. 1992. Should economists be dependent on official fertility projections. *Challenge* July/Aug:51–53

Easterlin RA, Condran GA. 1976. A note on the recent fertility swing in Australia, Canada, England and Wales and the United States. In *Population, Factor Movements and Economic Development: Studies Presented to Brinley Thomas*, ed. H Richards, 1:140–51. Cardiff: Univ. Wales

Easterlin RA, Crimmins EM. 1988. Recent social trends: changes in personal aspirations of American youth. *Soc. Sci. Res.* 72:217–23

Easterlin RA, Crimmins EM. 1991. Private materialism, personal self-fulfillment, family life, and public interest: the nature, effect, and causes of recent changes in the values of American youth. *Public Opin. Q.* 55:499–533

Easterlin RA, Macdonald C, Macunovich DJ. 1990a. Retirement prospects of the baby boom generation: a different perspective. *Gerontology* 30:776–83

Easterlin RA, Macdonald C, Macunovich DJ. 1990b. How have the American baby boomers fared? Earnings and economic well-being of young adults, 1964–1987. *J. Popul. Econ.* 3:277–90

Easterlin RA, Macunovich DJ, Crimmins EM. 1993a. Economic status of the young and old in the working age population, 1964 and 1987. In *The Changing Contract Across Generations*, ed. VL Bengston, WA Achenbaum, 1:67–85. New York: de Gruyter. 311 pp.

Easterlin RA, Schaeffer CM, Macunovich DJ. 1993b. Will the baby boomers be less well off than their parents? Income, wealth, and family circumstances over the life cycle in the United States. *Popul. Dev. Rev.* 19:497–522

Easterlin RA, Schapiro MO. 1979. Homicide and fertility rates in the United States: a comment. *Soc. Biol.* 26:341–43

Ehrenberg RG. 1994. *Modern Labor Economics*. New York: Harper Collins

Elliot DS, Huizinga D, Menard S. 1989. *Multiple Problem Youth: Delinquency, Substance Use, and Mental Health Problems*. New York: Springer-Verlag

Ermisch JF. 1979. The relevance of the "Easterlin hypothesis" and the "new home economics" to fertility movements in Great Britain. *Popul. Stud* 33:39–58

Ermisch JF. 1980 Time costs, aspirations and the effect of economic growth on German fertility. *Oxford Bull. Econ Stat.* 42:125–43

Ermisch JF 1988a. Fortunes of birth: the impact of generation size on the relative earnings of young men. *Scot. J Polit. Econ.* 35: 266–82

Ermisch JF. 1988b. British labour market responses to age distribution changes. See Lee et al 1988, pp. 76–86

Fair RC, Macunovich DJ. 1993. *Estimated relative income effects on the labor force participation of women and men 20–24*. Williams College, Williamstown, MA. Unpublished ms.

Falaris EM, Peters HE. 1985. *The Effect of the Demographic Cycle on Schooling and Entry Wages. Econ. Res. Ctr/NORC Discuss. Pap. 85-6*, Chicago, IL

Falaris EM, Peters HE. 1991a. Schooling choices and demographic cycles. *J. Hum. Resourc.* 27:552–74

Falaris EM, Peters HE. 1991b. Leveling the peaks and troughs of the demographic cycle: an application to school enrollment rates: a comment *Rev. Econ. Stat.* 73:572–75

Freeman RB. 1979. The effect of demographic factors on age-earnings profiles in the US. *J. Hum. Resourc.* 14:289–313

Goldin C. 1990. *Understanding the Gender Gap*. New York: Oxford Univ. Press

Gustafsson S. 1992. Cohort size and female labour supply. *Eur. J. Popul.* 8:1–21

Holinger PC, Offer D, Zola MA. 1988. A prediction model of suicide among youth. *J. Nerv. Ment. Dis.* 176:275–79

Inglehart R. 1990. *Culture Shift in Advanced Industrial Society*. Princeton, NJ: Princeton Univ. 484 pp.

Jencks C. 1981. Destiny's tots. *NY Rev. Books* 28(15):30–32

Kahn JR, Mason WM. 1987. Political alienation, cohort size, and the Easterlin hypothesis. *Am. Sociol. Rev.* 52:155–69

Katz LF, Murphy KM. 1992. Changes in relative wages, 1963–1987: supply and demand factors. *Q. J. Econ.* 107:35–78

Kelly WR, Cutright P. 1984. Economic and other determinants of annual change in U.S. fertility: 1917–1976. *Soc. Sci. Res.* 13:250–67

Keyfitz N. 1991. Subreplacement fertility: the third level of explanation. See Lutz 1991, pp. 235–46

Killingsworth MR. 1983. *Labor Supply*. Cambridge: Cambridge Univ. Press

Klevmarken NA. 1993. Demographics and the dynamics of earnings. *J. Popul. Econ.* 6:105–22

Lee R. 1974. The formal dynamics of controlled populations and the echo, the boom and the bust. *Demography* 11:563–85

Lee RD. 1976. Demographic forecasting and the Easterlin hypothesis. *Popul. Dev. Rev.* 2:459–68

Lee RD, Arthur WB, Rodgers G, eds. 1988. *Economics of Changing Age Distributions in Developed Countries*. Oxford: Clarendon. 221 pp.

Lester D. 1991. Size of youth cohort and suicide rate in Japan. *Percept. Motor Skills* 73: 508

Lesthaeghe R, Surkyn J. 1988. Cultural dynamics and economic theories of fertility change. *Popul. Dev. Rev.* 14:1–45

Leveson I. 1980. *Generational Crowding: Economic, Social and Demographic Effects of Changes in Relative Cohort Size*. New York: Hudson Inst. 161 pp.

Levy FS, Michel RC. 1986. An economic bust for the baby boom. *Challenge* 29:33–39

Lilliard LL, Macunovich DJ. 1989. *Why the baby bust cohorts haven't boomed yet: a reconsideration of cohort variables in labor market analyses*. Presented at Ann. Meet. Popul. Assoc. Am., Baltimore

Lin C, Chu Y. 1985. Further evidence of cohort size effects on earnings: the case of Taiwan. *J. Econ. Dev.* 10:101–21

Lindert PH. 1978. *Fertility and Scarcity in America*. Princeton, NJ: Princeton Univ. Press. 395 pp.

Lundberg S. 1985. The added worker effect. *J. Lab. Econ.* 3:11–37

Lutz W, ed. 1991. *Future Demographic Trends in Europe and North America: What Can We Assume Today?* London: Academic. 585 pp.

MacDonald MM, Rindfuss RR. 1978. Relative economic status and fertility: evidence from a cross-section. *Res. Popul. Econ.* 1:291–307

MacDonald MM, Rindfuss RR. 1981. Earnings, relative income, and family formation. *Demography* 18:123–36

Macunovich DJ. 1993a. *The missing factor: variations in the income effect of the female wage on fertility in the U.S.* Williams College, Williamstown, MA Unpublished ms.

Macunovich DJ. 1993b. Will U.S. fertility rise? Watch the wage. *Popul. Today* 21(10):6–10

Macunovich DJ. 1993c. *Cohort size effects on enrollment decisions*. Williams College, Williamstown, MA. Unpublished ms.

Macunovich DJ. 1995a. A review of recent developments in the economics of fertility. In *Household and Family Economics*, ed. P Menchick. In press

Macunovich DJ. 1995b. Marriage and divorce in the U.S.: evidence of cohort size effects. *J. Popul. Econ.* In press

Macunovich DJ, Easterlin RA. 1990. How parents have coped: the effect of life-cycle on the economic status of pre-school age children, 1964–89. *Popul. Dev. Rev.* 16:301–25

Martin LG, Ogawa N. 1988. The effect of cohort size on relative wages in Japan. See Lee et al 1988, pp. 59–75

Mason WM, Kahn JR. 1989. Reply to O'Brien and Gwartney-Gibbs. *Am. Sociol Rev.* 54: 480–84

Maxim PS. 1985. Cohort size and juvenile delinquency: a test of the Easterlin hypothesis. *Soc. Forces* 63:661–81

Menard S. 1992. Demographic and theoretical variables in the age-period-cohort analysis of illegal behavior. *J. Res. Criminol.* 29:178–99

Menard S, Elliot DS. 1990. Self-reported offending, maturational reform, and the Easterlin hypothesis. *J. Quant. Criminol.* 6: 237–67

Menard S, Huizinga D. 1989. Age, period, and cohort effects on self-reported alcohol, marijuana, and polydrug use: results from the national use survey. *Soc. Sci. Res.* 18:174–94

Moffit RA. 1982. Postwar fertility cycles and the Easterlin hypothesis: a life-cycle approach. *Res. Popul. Econ.* 4:237–52

Murphy KM, Plant M, Welch F. 1988. Cohort size and earnings in the USA. See Lee et al 1988, pp. 39–58

Murphy KM, Welch F. 1992. The structure of wages. *Q. J. Econ.* 107:285–326

O'Brien RM. 1989. Relative cohort size and age-specific crime rates: an age-period-relative cohort size model. *Criminology* 27:57–78

O'Brien RM, Gwartney-Gibbs PA. 1989. Relative cohort size and political alienation: three methodological issues and a replication supporting the Easterlin hypothesis. *Am. Sociol. Rev.* 54:476–80

O'Connell M. 1978. The effect of changing age distribution on fertility: an international comparison. *Res. Popul. Econ.* 1:233–45

Olneck MR, Wolfe BL. 1978. A note on some evidence on the Easterlin hypothesis. *J. Polit. Econ.* 86:953–58

Olsen RJ. 1994. Fertility and the size of the U.S. labor force. *J. Econ. Lit.* 32:60–100

Oppenheimer VK. 1976. The Easterlin hypothesis: another aspect of the echo to consider. *Popul. Dev. Rev.* 2:433–57

Oppenheimer VK. 1982. *Work and the Family: A Study in Social Demography*. New York: Academic. 473 pp.

Oropesa RS. 1985. Subjective relative affluence and expected family size. *Sociol. Soc. Res.* 69:501–15

Pampel FC. 1993. Relative cohort size and fertility; the socio-political context of the Easterlin effect. *Am. Sociol. Rev.* 58:496–514

Preston SH. 1982. Letter. *New York Rev. Books* 28(21–22):67

Preston SH, McDonald J. 1979. The incidence of divorce within cohorts of American marriages contracted since the Civil War. *Demography* 16.1–25

Pullum TW. 1980. Separating age, period, and cohort effects in white U.S. fertility, 1920–1970. *Soc. Sci. Res.* 9:225–44

Riboud M. 1987. Labor-market response to changes in cohort size: the case of France. *Eur. J. Popul.* 3:359–82

Rindfuss RR, Sweet JA. 1977. *Postwar Fertility Trends and Differentials in the United States*. New York: Academic. 225 pp.

Robertson M, Roy AS. 1982 Fertility, labor force participation and the relative income hypothesis: an empirical test of the Easterlin-Wachter model on the basis of Canadian experience. *Am. J. Econ. Sociol.* 41:339–51

Russell LB. 1982. *The Baby Boom Generation and the Economy* Washington, DC: Brookings Inst. 183 pp.

Rutten A, Higgs R. 1984 Graphic tests of the Easterlin hypothesis: science or art? *Res. Popul. Econ.* 5:201–21

Samuelson P. 1976. An economist's non-linear model of self-generated fertility waves. *Popul. Stud.* 30.243–47

Sanderson WC. 1976. On two schools of the economics of fertility. *Popul. Dev. Rev.* 2: 469–78

Sanderson WC. 1984. Review of *Birth and Fortune*. *J. Econ. Lit.* 22:1681–82

Schapiro MO. 1988. Socio-economic effects of relative income and relative cohort size. *Soc. Sci. Res.* 17:362–83

Schapiro MO, Easterlin RA. 1981. Educational attainment by sex and age, 1980–2000. *Rev. Public Data Use* 9.323–29

Schultz TP. 1981 *Economics of Population*. Reading, MA: Addison-Wesley

Schultz TP. 1986. Review of RA Easterlin and EM Crimmins, *The Fertility Revolution: A Supply-Demand Analysis*. *Popul Dev. Rev.* 12:127–40

Shields M, Tracy RL. 1986. Four themes in fertility research. *South. Econ. J.* 53 201–16

Smith DP. 1981. A reconsideration of Easterlin cycles. *Popul. Stud.* 35:247–64

Smith JP, Ward MP. 1985. Time-series growth in the female labor force. *J Labor Econ.* 3:S59–S90

Smith JP, Welch F. 1981. No time to be young: the economic prospects for large cohorts in the United States. *Popul. Dev Rev.* 7:71–83

Smith MD. 1986. The era of increased violence in the United States: age, period, or cohort effect? *Sociol. Q.* 27:239–51

Stapleton DC, Young DJ. 1984. The effect of demographic change on the distribution of wages, 1967–1990. *J. Hum. Resourc.* 19 175–201

Stapleton DC, Young DJ. 1988. Educational attainment and cohort size. *J. Labor Econ.* 6:330–61

Steffensmeier D, Streifel C, Harer MD. 1987. Relative cohort size and youth crime in the United States. *Am. Sociol. Rev.* 52:702–10

Steffensmeier D, Streifel C, Shihadeh ES. 1992. Cohort size and arrest rates over the life course: the Easterlin hypothesis reconsidered. *Am. Sociol. Rev.* 57:306–14

Sweet JA, Rindfuss RR. 1983. Those ubiquitous fertility trends: United States, 1945–1979. *Soc. Biol.* 30:127–39

Thornton A. 1978. The relationship between fertility and income, relative income, and subjective well-being. *Res. Popul. Econ.* 1: 261–90

Thornton A. 1979. Fertility and income, consumption aspirations, and child quality standards. *Demography* 16:157–76

US Bureau of the Census. 1993. *Statistical Abstract*. Washington, DC: US Govt. Print. Off.

Wachter KW. 1991. Elusive cycles: Are there dynamically possible Lee-Easterlin models for U.S. births? *Popul. Stud.* 45:109–35

Wachter KW, Lee RD. 1984. U.S. births and limit cycle models. *Demography* 26:99–115

Wachter ML. 1975. A time-series fertility equation: the potential for a baby-boom in the 1980s. *Int. Econ. Rev.* 16:609–24

Wachter ML. 1977. Intermediate swings in labor-force participation. *Brookings Pap. Econ. Act.* 2:545–74

Wachter ML, Wascher WL. 1984. Leveling the peaks and troughs in the demographic cycle: an application to school enrollment rates. *Rev. Econ. Stat.* 66:208–15

Welch F. 1979. Effects of cohort size on earnings: the baby boom babies' financial bust. *J. Polit. Econ* 87:S65–S97

Westoff CF. 1991. The return to replacement fertility: a magnetic force? See Lutz 1991, pp. 227–33

Whittington LA, Alm J, Peters HE. 1990. Fertility and the personal exemption: implicit pronatalist policy in the United States. *Am. Econ. Rev.* 80:545–56

Wright RE. 1989 The Easterlin hypothesis and European fertility rates. *Popul. Dev. Rev.* 15: 107–22

Wright RE 1991. Cohort size and earnings in Great Britain. *J. Popul. Econ.* 4:295–305

Wright RE, Maxim PS. 1987. Canadian fertility trends: a further test of the Easterlin hypothesis. *Can. Rev Sociol. Anthropol.* 24:339–57

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UNAUTHORIZED IMMIGRATION TO THE UNITED STATES

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KEY WORDS: illegal, immigration, unauthorized, undocumented, United States

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ABSTRACT

This paper surveys research on the size of the undocumented immigrant population in the United States, the causes and consequences of illegal migrant flows, public attitudes toward unauthorized migrants, and the history of attempts to control the volume of undocumented migration. It concludes that there are powerful push and pull factors that create and sustain the volume of unauthorized migration, that there is little evidence that undocumented migrants have negative labor market consequences despite what the general public thinks, that US policy has been largely powerless to make a permanent dent in undocumented immigration, and that the current level of clandestine US immigration may not be far from what society might view as socially optimal.

INTRODUCTION

Illegal immigration to the United States is in the public eye once again. Televised accounts of the bombing of the World Trade Center in New York, the Zoe Baird hearings, and the grounding of the Golden Venture ship carrying large numbers of undocumented Chinese immigrants have made the problem difficult to ignore. In addition, such individual states as California, Florida, and Arizona, concerned about the number of unauthorized migrants within their jurisdictions, are seeking reimbursement from the federal government for

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an array of education, health, and other social services they are required by federal law to provide to these individuals. For numerous reasons, illegal immigration is a difficult issue to study. Not the least of the obstacles is the fact that the number of unauthorized immigrants entering the United States is unobserved and therefore not precisely known. In addition, no census or other federally sponsored survey asks respondents about their legal status, so the impact of undocumented immigration is often inferred from other indicators. The public's impression about unauthorized migration is frequently formed from scenes of Cubans and Haitians intercepted on the high seas or from pictures of clandestine migrants crossing the Mexico–United States border. As a consequence, the public perception about the nature and consequences of illegal immigration may differ substantially from what the research literature suggests.

This review surveys the field of undocumented immigration to the United States, partly to identify areas of research controversy and partly to establish a factual base. The former objective may help to guide future research, while the latter can serve as the basis for policy formulation and outreach efforts to provide better information to the public. The paper is divided into six parts. First, we consider the demographic dimensions of the issue, focusing on the extent of unauthorized immigration to the United States. Second, we review US public opinion toward immigration in general and illegal immigration in particular. Here a historical perspective is used to show how attitudes have changed through time. Third, we explore the causes of undocumented US immigration with attention to economic and social factors that push or pull migrants. Fourth, the social and economic implications of illegal immigration are addressed, with special emphasis on labor market and fiscal impacts. Fifth, policies to affect the stocks and flows of illegal migrants are reviewed. Although we approach this topic historically, most of our attention is focused on the 1986 Immigration Reform and Control Act (IRCA). We conclude with a brief discussion of prospects for the future.

WHAT DO THE NUMBERS TELL US?

Because the volume of illegal US immigration is not directly observed, studies of the gross flow of undocumented migration across the Mexico–United States border have typically invoked Immigration and Naturalization Service (INS) data on the number of border apprehensions of unauthorized aliens as a proxy for the size of the illegal migrant flow. Such statistics are generated whenever the US Border Patrol apprehends (or arrests) someone who is in the country illegally (White et al 1990). Most unauthorized migrants are captured either as they cross the border or shortly thereafter (Espenshade 1990). In addition, attempted border crossings have been densely concentrated along a few short stretches of border

(Singer et al 1994). As an extreme example, the Chula Vista station in the San Diego sector covers just a single mile of border, yet it records more apprehensions than any other station (Federation for American Immigration Reform 1989). Five out of six apprehensions are adult male Mexican nationals. When Mexican women and their children are included, the total Mexican proportion of all apprehensions rises to nearly 98%. In general, the typical undocumented migrant is a young adult Mexican male who comes across the southern border near a major US city and who, unless he manages to avoid detection altogether, is in the United States for a few hours or days at most before being apprehended by the US Border Patrol (Espenshade et al 1991).

Trends in the annual number of apprehensions are graphed in Figure 1. The number of apprehensions before 1950 was relatively small, especially prior to 1940—just 128,000 in the decade of the 1920s, 147,000 in the 1930s, rising to nearly 1.4 million during the 1940s (US Immigration and Naturalization Service 1993). This increase continued into the early 1950s. In the three years from 1951 to 1953 there were nearly two million alien apprehensions in the

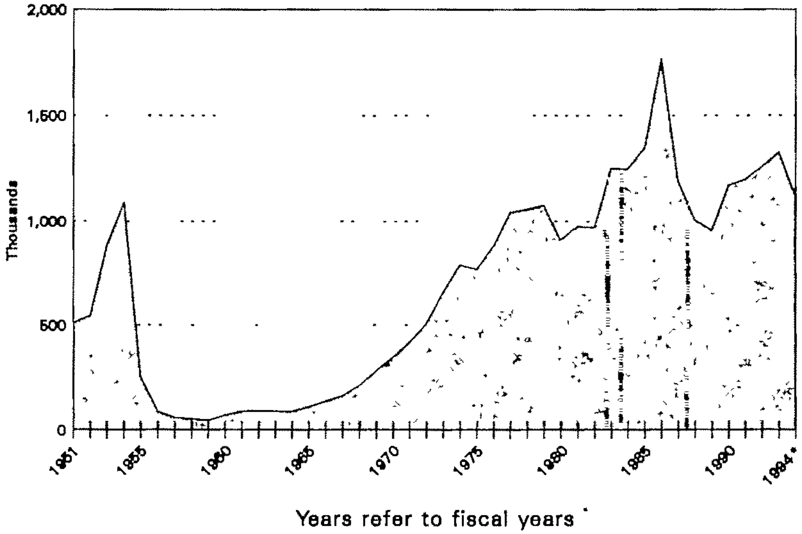

Figure 1 Aliens apprehended, 1951–1994 Estimated for 1994 with October-June FY 94 data. (Source: US Immigration and Naturalization Service 1993)

United States—far more than the recorded number in all prior years combined. By 1954 the illegal alien problem was perceived as so serious that the US Border Patrol launched "Operation Wetback" during which more than one million undocumented Mexican migrants, together with some persons who were US citizens, were rounded up and deported back to Mexico. Within five years the number of illegal alien apprehensions dropped by 95% to fewer than 50,000 in 1959 (US Immigration and Naturalization Service 1993).

The increase accelerated again after 1964 when Congress terminated the bracero program in the face of public opposition to conditions under which migrant workers lived, the influence of the US Civil Rights movement, and the effective lobbying of labor, church, and ethnic groups (Bean et al 1989). The Bracero guestworker program had begun in 1942 to relieve wartime labor shortages and to legalize and control the flow of Mexican agricultural workers to pick crops in western US states. When the program ended, job-seeking Mexicans who had grown accustomed to working in the United States and who found they no longer had any legal means of entry continued to come illegally (Bouvier & Gardner 1986). In this sense, agricultural workers that came from Mexico following World War II, some legally as Braceros and others illegally, were "the historical predecessors of today's undocumented aliens" (Vialet 1989: 414). The number of apprehensions rose more or less steadily after the late 1960s to a peak of 1.8 million in 1986. The numbers declined in the next few years, gratifying the proponents of IRCA who interpreted the decline as a sign that the new law designed to slow the flow of illegal immigrants into the country was working. But the decline proved to be short-lived and reversed again starting in 1990.

Despite their widespread use as a proxy for unauthorized migrant flows, apprehensions data are a conceptually inappropriate indicator because they measure undocumented aliens who have *failed* in their attempt to enter the United States, whereas the issue of general policy and research interest pertains to the number who *succeeded* (Briggs 1984). More specifically, not all aliens who enter the United States clandestinely are captured by the Border Patrol. Some migrants are apprehended several times in the same reporting period, with the consequence that INS arrest figures literally refer to counts of the number of apprehensions and not to the number of persons apprehended. Finally, the level of apprehensions is sensitive to changes in Border Patrol effectiveness in locating and apprehending illegal aliens. Despite these limitations, Espenshade (1995) suggests that the number of apprehensions and the estimated level of the underlying undocumented flow are correlated at 0.90. One may conclude that *changes* in the number of apprehensions track *changes* in the volume of illegal immigration reasonably well. On the other hand, the same evaluation shows that the estimated size of the illegal migrant flow is roughly 2.2 times the number of Border Patrol arrests.

Estimates of the monthly gross volume of unauthorized Mexico-US migration for the period 1977–1988 are pictured in Figure 2. These estimates are derived from INS data on total and repeat apprehensions and are based on Espenshade's (1990) repeated trials model. There is a strong seasonal pattern to illegal migration. With few exceptions, the illegal flow is smallest in November and December when undocumented migrants return home for Christmas and the fiestas (Cornelius 1989), and it resumes again in the spring and summer months. There seems to be a slight downward trend until 1982 when the collapse in world oil prices created disruptions in Mexico's economy, followed by a rise through the end of 1986 when the passage of IRCA altered the usual seasonal pattern. Across the 12-year period, the estimated undocumented flow has an average monthly value of about 175,000, with a minimum of 63,000 and a maximum of 338,000. The repeated trials model makes the simplifying assumption that all migrants face the same probability of apprehension within a given month, regardless of their community of origin, number of trips to the United States, or the number of prior attempts made that month to cross the border. This assumption is unavoidable when using aggregate INS

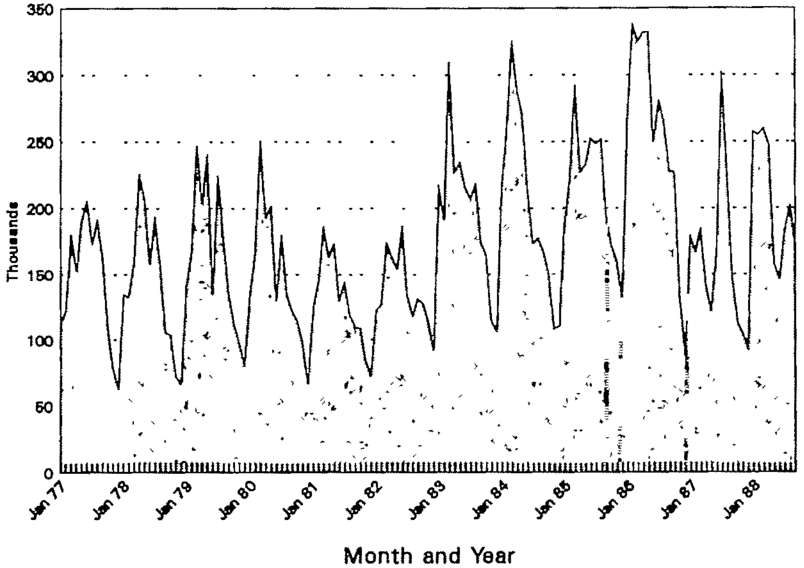

Figure 2 Estimated size of the undocumented US migrant flow, 1977–1988. All southern border sectors are combined. (Source: Espenshade 1990)

data, but with micro data one could test for heterogeneity in apprehension risks among undocumented migrant cohorts and could examine the possibility of learning by doing, which could lower apprehension risks on subsequent trips or subsequent attempts on the same trip.

The gross flow of unauthorized aliens is not the same as the net flow, because many illegal aliens depart the United States each year. Researchers at the US Bureau of the Census estimate that the size of the US undocumented alien population grew by an average annual amount somewhere between 100,000 and 300,000 during the period from 1980 to 1983 (Passel 1986). Based on estimates of the number of undocumented aliens counted in the June 1986 and June 1988 Current Population Surveys (CPS), Woodrow & Passel (1990) estimated that the annual net flow of undocumented migrants to the United States between 1986 and 1988 was 246,000. An alternative estimate by the same authors suggests that 70,000 net undocumented immigrants entered the country in the 18-month period follow January 1987. The US Bureau of the Census is now using 200,000 as the net annual increase in the undocumented US population (Fernandez & Robinson 1994), claiming that this estimate is supported by comparisons of estimates from the November 1989 CPS with those from previous years (Woodrow 1991). But the net additions assumed by the Census Bureau may actually be too conservative. Warren (1994) puts the average annual change in the stock of undocumented persons in a range between 200,000 and 300,000 and calls an annual net addition of more than 250,000 during the early 1990s the "best guess." Warren's figures have greater credibility because they are based on persons who overstay their visas as well as those who enter the United States without inspection (Fix & Passel 1994).

Great controversy has in the past characterized estimates of the total number of undocumented migrants resident in the United States, with some estimates exceeding 10 million (Keely 1982, Bos 1984). Recent research has refined these estimates, and today there is greater agreement about possible error ranges (Bean et al 1990). Research by Warren & Passel (1987) indicates that the number of undocumented settlers and long-term sojourners who were counted in the 1980 US decennial census was about 2.1 million. More than half of these (1.1 million) were from Mexico. Informal estimates suggested that between one half and two thirds of the stock of illegal aliens in the United States were included in the 1980 census, which implies that the total number of undocumented persons resident in the country in 1980 was in the range from 2.5 to 3.5 million (Fix & Passel 1994).

By 1986 between 3 million and 5 million unauthorized aliens were estimated to be living in the United States. The numbers dropped dramatically, however, following IRCA's legalization program which granted amnesty to roughly 2.8 million formerly illegal residents. Estimates for 1989 suggest that the number of undocumented persons had declined to somewhere within a range of 1.8 million to 3 million (Fix & Passel 1994). But the amnesty program was a one-time opportunity, and the number of illegals has once again started to increase. The best estimates for the early 1990s have been assembled by Warren (1994). He puts the total size of the undocumented population in October 1992 at 3.4 million. Individuals who came to the United States on a legal temporary visa and then later became unauthorized aliens because they overstayed their visa constitute roughly half of the undocumented population, whereas the other half came initially without proper documents and most likely crossed over US land borders between official ports of entry. As might be expected, Mexico is the leading source country and accounts for 1.3 million or about 40% of the total. In addition, California is the leading state of residence of the illegally resident population with a total of 1.4 million people. California and six other states—New York, Texas, Florida, Illinois, New Jersey, and Arizona—account for 86% of the total illegal population. Finally, figures assembled by Fernandez & Robinson (1994) for April 1994 suggest that the total undocumented population now falls into a range between 3.5 and 4.0 million.

To put these numbers into perspective, Fix & Passel (1994) have estimated that the total foreign-born population in the United States is growing by about 700,000 each year, after the combined effects of legal and illegal entry, emigration, and death are included. The estimates we have reviewed suggest that unauthorized migration accounts for at least one third of all population growth due to immigration. In addition, total immigration accounts for about one third of US net annual population growth (Fix & Passel 1994).

PUBLIC OPINION TOWARD UNAUTHORIZED MIGRANTS

Americans have long held conflicting attitudes toward immigrants and immigration. We pride ourselves in being a "nation of immigrants," and yet many tend to view recent waves of immigrants with skepticism if not outright hostility. Drawing on more than a century of print media coverage of US immigration, Simon & Alexander (1993) show that little has changed in how immigrants are perceived. At least since the 1880s, immigrants have been assumed to take jobs away from and to lower wages of native workers, to add to the poverty population, and to compete for education, health and other social services. Negative feelings toward immigrants were reinvigorated as successive new waves arrived—first the Irish, then the Italians, then Mexicans, and now Asians. All that seems to have changed are the origins of migrants and the terms used to describe them. Seldom are new immigrants today referred to as they were in 1920 as the melting pot's "unsightly indigestible lumps" (quoted in Simon & Alexander 1993: 71).

Restrictionist immigration rules were first introduced in the United States after 1875, a period during which beliefs about the negative impacts of immigrants gained prominence (Simon 1985). The American public adopted a more liberal attitude toward foreign immigration following World War II, as evidenced by smaller proportions of respondents in opinion surveys who felt that immigration levels should be zero or at least reduced from current levels (Morris 1985). This more tolerant attitude lasted throughout much of the 1950s and 1960s but was replaced in the late 1970s and 1980s by a new wave of "neo-restrictionist" sentiment (Harwood 1986). More than three fourths of the general public surveyed in a 1990 Roper poll believed that US immigration levels should not increase, and nearly one half felt that the level should be lowered. Nearly two thirds of respondents to a 1993 *New York Times/CBS News* poll agreed that immigration levels should be reduced, and only 6% thought they should be increased (Espenshade & Hempstead 1994).

Several reasons have been advanced for the rise in neo-restrictionism, including fears associated with economic insecurity (Moehring 1988) and concerns over immigrants' undesirable cultural traits (Day 1990). But another unmistakable part of the explanation is the concern over unauthorized immigration. Commenting on the early 1980s situation, Passel (1986: 181) noted, "One important characteristic that distinguishes contemporary immigration from previous waves of immigration is the presence of significant numbers of undocumented, or illegal, immigrants." Espenshade & Hempstead (1994) found that respondents to a 1993 survey who thought that most recent US immigrants were illegal had a significantly higher tendency to regard current immigration levels as too high.

Only one study has analyzed public opinion toward undocumented immigration. Using data from a June 1983 survey of public attitudes toward undocumented immigration in southern California, Espenshade & Calhoun (1993) tested five hypotheses:

1. A labor market competition hypothesis suggests that persons having the lowest levels of socioeconomic status attainment are likely to have the most concern over job competition with new immigrants, and that they therefore will exhibit the most negative attitudes toward illegal migration and undocumented migrants.
2. A cultural affinity hypothesis predicts that individuals whose own cultural attributes are most like those of undocumented migrants will possess the strongest pro-immigrant attitudes.
3. An education hypothesis predicts that educational attainment and pro-immigrant attitudes will be positively correlated.
4. A utilitarian calculus hypothesis emphasizes perceived costs and benefits of migration and predicts that negative attitudes toward undocumented migration are associated with anxieties over one's material well-being.

5. A symbolic politics hypothesis that suggests that challenges to important symbols of American nationality may evoke anti-immigrant attitudes.

Espenshade & Calhoun (1993) find only weak support for the labor market competition hypothesis. There is firmer evidence for hypotheses relating to cultural affinity between respondents and undocumented migrants and to the role of education. Respondents' evaluations of tangible costs and benefits to themselves also influence their assessments of illegal immigration. Finally, the results provide additional support for a symbolic politics model of opinion formation when the model is extended to the issue of undocumented migration to the United States. More generally, the results support the notion that survey respondents' characteristics and their perceptions of migrants' behavior affect the way residents in southern California view both undocumented migrants and the overall impact of illegal immigration. Older survey participants are more likely to see illegal immigration in negative terms, whereas having more education and being Hispanic are each associated with greater optimism about undocumented migrants and illegal migration. At the same time, respondents who cast immigrants as poor and welfare dependent or as making little effort to learn English have some of the most unfavorable rankings of undocumented immigration and its impacts. Beliefs that immigrants are more likely to be on welfare, to commit crime, or to impose a fiscal burden on other taxpayers by receiving social services whose value exceeds the taxes migrants pay are consistently associated with more negative general attitudes about undocumented immigration. So, too, are views that the number of people with little or no English-speaking ability is likely to increase and that this growth will have a bad effect on ethnic relations.

ANTECEDENTS OF UNDOCUMENTED IMMIGRATION

Several theories have been advanced to explain the causes of unauthorized immigration to the United States. Massey et al (1993) have divided these explanations into those that account for the initiation of international movements and those that sustain and expand these movements once they have begun. In the first category Massey et al (1993) include economic approaches to international migration, including neoclassical economics and the "new economics of migration" along with dual labor market theory and world systems theory. In the latter category belong hypotheses originating from network theory, institutional theory, and a variety of factors promoting the cumulative causation of migration.

Neoclassical approaches portray potential migrants as (expected) income maximizers who will move to a new destination whenever the anticipated gains are sufficiently high. According to neoclassical macro theory, international migration is driven by regional imbalances in the supply and demand for labor. These imbalances promote low wages in countries where labor is plentiful relative to the amount of capital, and higher wages where labor is the scarcer factor of production. Migrants have an incentive to move from low-wage to high-wage countries until changing labor supplies bring international wage levels closer to parity. Because of rapid population growth in developing countries, this theory predicts that most international migration will be from poorer nations to more advanced industrialized ones. The micro counterpart to this macro theory views individuals as the relevant decisionmakers who weigh the present value of expected future income streams at a variety of potential destinations against the income expected at the origin. Expected income at alternative destinations will depend on average wage levels and the anticipated probability of securing employment as well as, in the case of unauthorized immigrants, on the probability of avoiding detection and deportation by immigration authorities (Harris & Todaro 1970, Todaro & Maruszko 1987). According to this theory, rational actors go where expected income is the highest (Massey et al 1993).

Work on the new economics of migration has been pioneered by Stark & Levhari (1982), Taylor (1986), and Stark (1991). This perspective differs from neoclassical economic theory in several important ways. First, the relevant actors are not individuals but rather families and households whose survival strategies include but often supersede those of individual household members. Second, although households may at times attempt to maximize income, family behaviors are often better understood in terms of efforts to minimize risk. In developed countries, the existence of well-developed capital markets and other insurance schemes helps to protect families against excessive risk. But these mechanisms are either absent or not sufficiently reliable in poorer countries, so families need to self-insure against sudden declines in economic fortune (Massey 1990). One way that families do this is by sending earners to other countries; risks can be diversified provided labor market and other economic conditions in the destination country are uncorrelated (or preferably negatively correlated) with those in the origin country.

Dual labor market theory focuses less on the motivations of individual workers and more on the chronic demand by industrial capitalists for foreign workers (Piore 1979). Many employers face inherently unstable demand for their products or services. Because the cost of underutilizing capital equipment falls on businesses whereas the cost of laying off workers falls on workers themselves, owners of capital have a natural incentive to deploy capital to meet the most stable portions of demand and to use labor to satisfy the more unpredictable portions (Massey et al 1993). This results in a situation where many workers in the secondary sector face job insecurity, low wages, and little prospect of upward mobility. This theory argues that native workers will be motivated to seek jobs in the primary sector of the economy where higher skills are required and where pay is better. Consequently, employers will turn to foreign labor to meet the less stable portions of demand. World systems theory argues that owners of capital are constantly driven by the search for lower costs and higher profits, and they will expand beyond the boundaries of advanced industrial economies to penetrate smaller countries on the margins of the world economy (Wallerstein 1974). The dislocations to indigenous labor that these developments bring create incentives for workers to search for employment elsewhere, sometimes in urban areas of their own countries and sometimes in other countries (Massey 1988).

Once migration has begun, other factors help to sustain it. One is the set of previous migrants on whom current or prospective migrants can draw for financial help, information, housing, and jobs. These sources of support may be especially reliable if former migrants are also family members or close kin, because kinship forges bonds of expected reciprocity and mutual support (Massey 1990). The practical implication is that migrant networks help to lower the costs and risks of migration, thereby imparting an inner momentum to migration streams once they are under way (Massey et al 1993). Institutions that spring up to facilitate international movement also help to perpetuate international migrant flows. In the United States, these include the sanctuary movement supported by a variety of local churches, a black market in fraudulent documents, and a greater use of coyotes (hired smugglers) to help avoid arrest by US immigration authorities. By lowering the costs and risks associated with clandestine migration, migrant networks and institutions supporting undocumented migrants help pave the way for more unauthorized migrants to come in later waves, a process that Myrdal (1957) and Massey (1990) have referred to as the cumulative causation of migration.

Empirical research on the causes of undocumented Mexico-US migration has frequently relied on ethnographic survey data collected from one or more Mexican origin communities. This large body of research covering more than two decades of community studies has recently been summarized by Durand & Massey (1992) who find that four elements are crucial in understanding the patterns and processes of Mexican migration to the United States. First, the age of the migration stream refers to how long a community has been sending migrants to the United States. More established migrant flows are correlated with a larger fraction of migrants from the poorest segments of society, a larger share of women and children in the flow, and a smaller proportion of migrants without proper legal documents. Second, the occupational niche that migrants occupy when they first enter the United States also matters. Agricultural employment has traditionally been associated with greater participation by women and children, with larger numbers of legalized migrants, and with greater reliance on temporary migration strategies. Third, Mexican sending communities that have access to urban markets, a well developed infrastructure, and a more egalitarian distribution of productive resources are more likely to contain migrants who spend a large fraction of their migrant earnings on productive purposes. Finally, the distribution and quality of agricultural land is important in that communities where land is tightly controlled in the hands of a few individuals are more likely to send landless day laborers as migrants. The degree of inequality in landholding also affects the ability of return migrants to invest their savings in agriculture.

Additional empirical work has concentrated on modeling the determinants of the monthly flow of undocumented migrants shown earlier in Figure 2. Espenshade's (1990) results suggest that demographic, economic, and policy variables are important determinants of variations in unauthorized alien flows across the Mexico-US border. The flow is increased by Mexican population growth in the young-adult ages, by an improvement in economic conditions in the United States relative to Mexico (measured by relative wage and unemployment rates), and by the unfolding of the planting and harvesting season in agriculture in the spring and early summer months. These influences, together with a series of policy variables related to IRCA's implementation in 1986, account for nearly 90% of the variation in illegal alien flows between 1977 and 1988. Once these factors are controlled, the perceived probability of being located and arrested at the Mexico-US border by immigration authorities has relatively little to do with variations in unauthorized migrant flows (Espenshade 1994).

Household data collected from Mexican sending communities also sheds light on the determinants of illegal alien flows. On the basis of approximately 1350 households from seven communities sampled during the winter months of 1987–1988 through 1989–1990, Donato et al (1992) estimate an age-period model of the probability that males would make an undocumented trip to the United States and conclude that probabilities are highest for men between the ages of 15 and 29, are lowest prior to 1940, rise until the 1960s when they settle back, and then rise again, showing no tendency to be reduced by IRCA's passage. Migrants from rural areas also display sharply higher probabilities of migrating illegally than do urban residents.

CONSEQUENCES OF UNAUTHORIZED IMMIGRATION

As previously noted, illegal immigration may add as many as 300,000 new US residents each year. In addition, fluctuations in the level of undocumented migrant flows are inversely associated with the probability of being apprehended at the Mexico-US border on any given attempt to enter the United States clandestinely (Espenshade & Acevedo 1995). Nevertheless, the consequences of illegal immigration that are generally of greatest concern are not demographic but those having to do with labor market and fiscal impacts.

Labor Market Implications

One important set of issues concerns migrants' own wages. Do they earn less than legal immigrants or native workers? Do undocumented workers experience upward wage mobility with greater experience in US labor markets? In addition, does the presence of undocumented workers in US labor markets have an adverse impact on the earnings and employment of native workers?

Most research has concluded that undocumented migrants are paid less than other workers (Cobb-Clark et al 1994). This effect is generally explained in terms of reduced labor market experience, lower job-related skills, or just outright employer discrimination. North & Houston (1976) examined hourly wage rates among a group of 793 apprehended illegal aliens who were interviewed in metropolitan areas across the United States in May and June 1975. Mexican nationals earned significantly less than undocumented workers from other countries. In addition, unauthorized workers in construction, manufacturing, and other industrial divisions earned substantially less per hour than did all US production and nonsupervisory workers ($2.66 versus $4.47), and these unauthorized laborers worked nearly 9 hours more per week. More than a fifth of the illegal sample was paid less than the minimum wage on their most recent job.

Chiswick (1991) attributes these differentials to the lower skill levels of illegals. Illegal aliens do not receive wages that are lower than those of other workers with comparable levels of skill. Massey's (1987) explanation centers on work experience and attachment to particular employers. Illegals are paid lower wages than legal migrant workers, not because of their undocumented status per se but because of shorter labor market experience and less employer-specific capital. Massey concludes that undocumented migrants do not experience wage discrimination in US labor markets. Borjas & Tienda (1993) base their analysis on the employment and earnings of newly legalized immigrants compared with the experiences of all foreign-born persons in the United States. They find that illegal immigrants have high rates of labor force participation but typically earn about 30% less than their legal counterparts from the same region of the world. They also conclude that national origin accounts for about half the wage gap, suggesting that human capital differentials reflected in education and job skills are important determinants of lower wages for undocumented migrants. After controlling for age, English-language ability, schooling, and length of stay in the United States, Heer (1990) finds that legal immigrant males and females still earned significantly more than their undocumented counterparts. Employer discrimination could be part of the explanation, but the gap could also be due to unmeasured components.

Most undocumented migrants initially experience downward economic mobility when they enter the United States, but with added US labor market experience this trend later reverses. North & Houston (1976) found that the net effect of the US labor market on the occupational status of their respondents was negative, even though almost half of the sample that had been farmworkers in their home countries had moved into nonagricultural work in the United States. Similar patterns have been noted by Kossoudji & Cobb-Clark (1993) among a sample of undocumented Latinos who applied for amnesty under IRCA. Nearly two thirds of the sample experienced downward occupational mobility immediately after migrating to the United States, but half then moved up the occupational ladder in the period leading to their legalization application. Upward mobility was positively correlated with prior downward mobility, with improved English skills, and with experience in US labor markets. Despite these trends, undocumented Latino men remained clustered in traditional migrant occupations, a phenomenon that appears to extend to undocumented Latina women as well (Cobb-Clark & Kossoudji 1994). Other research by Chiswick (1984, 1986, 1991) suggests that upward economic mobility is widespread among undocumented workers and is related to schooling, prior work experience (especially in US labor markets), and experience with their current employer.

One of the alleged adverse labor market consequences of illegal immigration is that undocumented workers take jobs away from US citizens or otherwise lower the wages and working conditions of native workers. There is only slight statistical evidence for this view, and most of it is derived from case studies of a single labor market or specialized occupations or industries. When the broader US economy is examined, it is difficult to find strong evidence of negative effects on native workers. A study by Huddle et al (1985) based on field studies in the Houston-Galveston metropolitan area claimed that for every 100 working undocumented aliens 65 jobs are removed from legal residents. Martin (1986) finds evidence of job displacement by unauthorized workers in agriculture, food processing, services, and construction, and argues that processes of network recruitment and subcontracting lead to the exclusion of American citizens and legal residents from many workplaces. Cobb-Clark & Kossoudji (1994) also speculate that undocumented Latina women may provide long-term labor market competition for US workers employed in specific labor market niches.

But the balance of the empirical evidence suggests an alternative interpretation. After reviewing this evidence, Bean et al (1987: 685) conclude that "studies of labor market impact have found that the effects of immigrants (both legal and undocumented) on the wages and earnings of other labor force groups are either nonexistent or small (and sometimes positive)." In a study of the Los Angeles labor market, an area with a large proportion of undocumented workers, Muller & Espenshade (1985) find no evidence that undocumented migrants are taking jobs away from native-born blacks, a group with whom aliens are likely to be competing. Similar conclusions are reached by McCarthy & Valdez (1986). Based on an examination of metropolitan area labor markets in the US southwest, Bean & Lowell (1985) conclude that undocumented Mexican immigrants are labor market substitutes for other legal Mexican immigrants and labor market complements with native-born Mexican Americans. No consistent or statistically significant patterns exist between undocumented migrants and the majority white population.

In additional analyses of 1980 census data, Bean et al (1988) discovered that undocumented migrants have little effect on the earnings of individuals in five other labor force categories. A greater concentration of undocumented Mexican workers in southwestern metropolitan labor markets increases native female earnings by a small amount (a 10% increase in the supply of Mexican illegals raises female earnings by about 0.5%) but has no measurable effect on the wages of blacks, native-born Mexican Americans, or on native white workers. Bean et al (1987) argue that the overall empirical findings are more consistent with the position that undocumented workers hold jobs that other groups find unattractive than with the widely held public perception that illegals compete with natives and especially with native-born minority workers for jobs and wages.

Fiscal Impacts of Illegal Immigrants

Do undocumented residents of the United States receive more in publically provided education, health care, and other social services than they pay for in taxes (e.g. sales taxes)? In a recent review of the fiscal impacts of US immigrants, Rothman & Espenshade (1992) found that the fiscal costs of US immigrants fall most heavily on state and, especially, local governments. Only at the level of the United States as a whole is there almost no evidence to indicate that immigrants impose net burdens on other taxpayers. And when one considers that national estimates aggregate influences across federal, state, and local levels, these results suggest that at the federal level alone immigrants provide a fiscal surplus. Only a few studies prior to 1992 explicitly considered the fiscal impacts of undocumented migrants. North & Houston (1976) found no adverse net fiscal effects at the national level. Weintraub & Cardenas (1984) concluded that unauthorized migrants confer large fiscal benefits to the state of Texas owing to their low use of public services and high tax payments. Undocumented migrants were estimated to use more services than the amount of their taxes at the county level in southern California (Community Research Associates 1980, Los Angeles County 1991).

Research in the past several years has tended to support these broad generalizations. Huddle (1993) focused on all immigrants (legal and undocumented) who have come to the United States since 1970 and estimated that their net annual cost to other US taxpayers at all levels of government is about $43 billion. Passel (1994) has argued that Huddle grossly underestimated taxes that immigrants pay. When these and other adjustments are made to Huddle's calculations, Passel estimates that immigrants incur no overall fiscal deficit but instead produce a $25–30 billion annual budgetary surplus. Los Angeles County's Internal Services Department estimated in 1992 that the net county fiscal cost associated with undocumented individuals was roughly $440 per person (Moreno-Evans 1992). Estimates for San Diego include both county and state data and show that net fiscal costs in 1992 were approximately $730 per capita when education, public health, criminal justice, and social service delivery are included (Auditor General of California 1992). These costs rose to $1110 per capita in 1993 when additional expenses associated with transportation, employment training, developmental services, and police protection were figured in (Rea & Parker 1993). Finally, Clark et al (1994) estimate the revenues and expenditures associated with undocumented immigrants in the seven states with the largest numbers of such individuals. Estimates are made for the costs of incarceration and public education and for revenues received in the form of state, sales, and property taxes. Unfortunately, it is impossible to draw conclusions about the net fiscal impacts of undocumented migrants because not all revenue and expenditure items are included.

One should not necessarily conclude from these fiscal estimates that states and localities would be better off without undocumented immigrants. First, knowing how to attribute public revenues and expenditures to households is a difficult task (Arnold 1979). Second, households headed by native-born individuals are also typically a fiscal burden at the state and local level (Espenshade & King 1994). Third, immigrants' participation in the economy is often ignored in these calculations, yet immigrants increase corporate profits and help generate employment for others through their work and consumption activities (Espenshade & King 1994). Fourth, the aggregate fiscal profile exhibited by undocumented immigrants at one point in time is a composite reflecting, among other things, initial wages at the time of immigration, the rate of labor market incorporation with added US experience, and the composition of the population by recency of arrival. Estimates of the rate of wage assimilation among immigrants are large and suggest that ten years of US experience offset most of the earnings disadvantage of new immigrants (LaLonde & Topel 1991). These considerations suggest that negative fiscal impacts abate with increased duration of US residence.

POLICIES AFFECTING UNAUTHORIZED IMMIGRATION

Concerns with undocumented US migration were first reflected in bills passed in 1888 and 1891 that allowed workers and other aliens who had entered the country illegally to be deported. By 1904 it was apparent that the 1882 Chinese Exclusion Act, designed to prohibit the immigration of Chinese laborers to the United States, was failing its intended purpose, and the Commissioner-General of Immigration assigned a group of mounted inspectors to patrol the Mexico-US border to prevent the smuggling of Chinese laborers through Mexico (Federation for American Immigration Reform 1989). Quantitative restrictions on US immigration that were introduced in the 1920s only served to intensify illegal immigration. One response was the creation in 1924 of the US Border Patrol—the uniformed enforcement arm of the Immigration and Naturalization Service. Simultaneously, the INS began keeping statistics on the number of apprehended aliens. The last major immigration action prior to World War II was the country's first legalization program, adopted in 1929 for the purpose of accommodating those long-term illegally resident aliens who were not otherwise eligible for lawful permanent residence (Levine et al 1985).

The bracero program introduced in the 1940s did little to stem the flow of illegal farmworkers. By the early 1950s mounting pressure to revisit immigration policy led to the passage of the 1952 Immigration and Nationality Act (INA). Among other provisions, the INA imposed penalties including fines and possible imprisonment for persons found guilty of "harboring" illegal aliens. However, in a concession to Texas agricultural interests, employers of illegal aliens were exempted from these penalties. The 1965 amendments to the INA hardly touched the question of illegal immigration. Nevertheless, as shown earlier, throughout this and later periods the number of apprehensions of undocumented aliens rose rapidly and reached a total of 8.3 million for the decade of the 1970s.

Armed with the widespread belief that the United States had "lost control of its borders" and backed by apparent public support, the US Congress in 1986 passed and President Reagan signed the Immigration Reform and Control Act. IRCA's primary objectives are to curb, if not entirely eliminate, the flow of undocumented immigrants into the country, and to decrease the number of undocumented aliens residing within the United States. To accomplish these goals, IRCA included: 1. new employer sanctions to restrict the hiring of undocumented workers, 2. legalization programs to which upwards of 3 million undocumented immigrants applied, and 3. stepped-up enforcement at the southern US border against future illegal migration (Bean et al 1989). The data in Figures 1 and 2 suggest what subsequent research has confirmed—that IRCA had at best a temporary effect in reducing the flow of unauthorized Mexico-US migrants (Donato et al 1992). The effect was greatest in 1987 and had already begun to wane by 1988, possibly because many would-be undocumented migrants delayed their trips to *El Norte* until they could better assess how the new law would be enforced (Espenshade 1990, Bean et al 1990, White et al 1990). Even though IRCA succeeded in raising the probability of apprehension along the Mexico-US border by increasing the number of Border Patrol agents and augmenting expenditures for physical capital used in enforcement activities, apprehension probabilities are not a significant determinant of the size of illegal migrant flows (Espenshade 1994). Moreover, Kossoudji (1992) has shown that greater INS enforcement can be counterproductive by encouraging more undocumented trips albeit of shorter duration. The consensus is that any initial deterrent effects of IRCA have disappeared as lax enforcement coupled with an active market in fraudulent documents has removed whatever teeth IRCA may once have had (Fix 1991, Espenshade 1992).

PROSPECTS FOR THE FUTURE

US immigration policy can intervene in the process of unauthorized migration in at least three ways: (*a*) after undocumented migrants have relocated inside the United States, (*b*) while they are in transit across the Mexico-US border, and (*c*) when an unauthorized trip is being planned but before it has begun. After an illegal migrant has evaded the Border Patrol and taken up residence in the US interior, the annual probability of being apprehended is roughly 1–2% (Espenshade 1994). Nor is the threat of border apprehension likely to be a strong deterrent, because most undocumented migrants are simply returned to the other side of the Mexico-US border where they keep on trying to enter until they eventually succeed (Donato et al 1992). Finally, an analysis of the determinants of undocumented migrant flows that includes perceived apprehension probabilities shows no association between these probabilities and the flow of undocumented migration at its source, that is, in the communities of Mexico and other countries that send unauthorized migrants to the United States (Espenshade 1994). These developments suggest that undocumented US migration is propelled by forces stronger than American resolve to halt it.

Whether IRCA achieves its intended aims in the longer run will be influenced by several factors related to domestic labor market conditions: US employers' needs for low-skill, low-wage labor and their willingness to risk fines and jail sentences for hiring illegal workers; the shortfall among legal workers as members of the baby-bust generation begin entering the labor market; and the extent to which business perceives that INS is determined to enforce the new law. The experience of other countries and of some US states with employer sanctions yields a mixed outlook for the likely future effectiveness of recent US initiatives to control undocumented immigration (Espenshade et al 1990). In addition, the success of IRCA will depend upon such international factors as the strength of external demand for illegal entry to the United States, which is, in turn, a function of the available number of legal immigrant visas, the imbalance between labor supply and job opportunities in countries below the US southern border, and differential wage rates between the United States and the Caribbean Basin nations (Espenshade 1989). Finally, although many supporters of the North American Free Trade Agreement with Canada and Mexico viewed NAFTA as a way of easing migration pressures from Mexico, research suggests that in the short-to-medium term NAFTA is likely to increase pressures for undocumented migration (Acevedo & Espenshade 1992). In the longer run, however, if free trade brings an improvement of the Mexican economy relative to the US economy, the incentives for unauthorized immigration are likely to weaken.

Whenever public policy attempts to control an undesirable activity—for example, crime, air pollution, or traffic congestion—there is a residual level of that activity that governments are willing to tolerate because the extra cost of eliminating it altogether greatly outweighs the extra benefit. Current INS enforcement practices do not stop all illegal immigration, although they probably do discourage some (especially on the part of non-Mexican nationals). Considering the substantially larger number of migrants who might enter under an open-border strategy, it could be argued that a net annual flow of 250,000–300,000 undocumented US migrants is not far from the socially optimal level. Surely there are draconian measures one could imagine that would result in a significantly smaller illegal flow. But these measures would compromise other important principles. We may have to conclude that the current level of unauthorized immigration is a price that most Americans are willing to pay to to maintain an open society.

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Literature Cited

Acevedo D, Espenshade TJ. 1992. Implications of a North American free trade agreement for Mexican migration into the United States. *Popul. Dev. Rev.* 18(4):729–44

Arnold F. 1979. Providing medical services to undocumented immigrants: costs and public policy. *Int. Migration Rev.* 13(4):706–15

Auditor General of California. 1992. *A Fiscal Impact Analysis of Undocumented Immigrants Residing in San Diego County. Report C-126, August.* Sacramento, CA: Off. Auditor General, Calif.

Bean FD, Edmonston B, Passel JS, eds. 1990. *Undocumented Migration to the United States: IRCA and the Experience of the 1980s.* Washington, DC: Urban Inst.

Bean FD, Espenshade TJ, White MJ, Dymowski RF. 1990. Post-IRCA changes in the volume and composition of undocumented migration to the United States: an assessment based on apprehensions data. See Bean et al 1990, pp. 111–58

Bean FD, Lowell BL. 1985. *Metropolitan Labor Markets and Earnings Attainment: The Effect of Undocumented Immigration. Texas Population Research Center Pap. No. 7.017.* Austin, TX: Univ. Tex.

Bean FD, Lowell BL, Taylor LJ. 1988. Undocumented Mexican immigrants and the earnings of other workers in the United States. *Demography* 25(1):35–52

Bean FD, Telles EE, Lowell BL. 1987. Undocumented migration to the United States: perceptions and evidence. *Popul. Dev. Rev.* 13(4):671–90

Bean FD, Vernez G, Keely CB. 1989. *Opening and Closing the Doors: Evaluating Immigration Reform and Control.* Washington, DC: Urban Inst.

Borjas GJ, Tienda M. 1993. The employment and wages of legalized immigrants. *Int. Migration Rev.* 27(4):712–47

Bos E. 1984. Estimates of the number of illegal aliens: an analysis of the sources of disagreement. *Popul. Res. Policy Rev.* 3(3): 239–54

Bouvier LF, Gardner RW. 1986. Immigration to the US: the unfinished story. *Popul. Bull.* 41(4). Washington, DC: Popul. Ref. Bur.

Briggs V. 1984. Methods of analysis of illegal immigration into the United States. *Int. Migration Rev.* 18(3):623–41

Chiswick BR. 1984. Illegal aliens in the United States labor market: analysis of occupational attainment and earnings. *Int. Migration Rev.* 18(3):714–32

Chiswick BR. 1986. Illegal aliens: a preliminary report on an employee–employer survey. *Am. Econ. Rev.* 76(2):253–57

Chiswick BR. 1991. Illegal immigration and immigration control. In *US Immigration Policy Reform in the 1980s: A Preliminary Assessment,* ed. FL Rivera-Batiz, SL Sechzer, IN Gang, pp. 45–63. New York: Praeger

Clark RL, Passel JS, Zimmermann WN, Fix ME. 1994. *Fiscal Impacts of Undocumented Aliens: Selected Estimates for Seven States. Project Report, September.* Washington, DC: Urban Inst.

Cobb-Clark DA, Kossoudji SA. 1994. *Mobility in El Norte: employment and occupational changes for undocumented Latina women.* August. Illinois State Univ. Unpublished manuscript

Cobb-Clark DA, Shiells CR, Lowell BL. 1994. Immigration reform: the effects of employer sanctions and legalization on wages. March, Illinois State Univ. Unpublished manuscript

Community Research Associates. 1980. *Undocumented Immigrants: Their Impact on the County of San Diego.* San Diego, CA: CRA

Cornelius WA. 1989. Impacts of the 1986 US immigration law on emigration from rural Mexican sending communities. *Popul. Dev. Rev.* 15(4):689–705

Day CL. 1990. *Ethnocentrism, Economic Competition, and Attitudes Toward US Immigration Policy.* Presented at Annu. Meet. Midwest Polit. Sci. Assoc., Chicago, Illinois, April 5–7

Donato KM, Durand J, Massey DS. 1992. Stemming the tide? Assessing the deterrent effects of the Immigration Reform and Control Act. *Demography* 29(2):139–57

Durand J, Massey DS. 1992. Mexican migration to the United States: a critical review. *Latin Am. Res. Rev.* 27(2):3–42

Espenshade TJ. 1989. Growing imbalances between labor supply and labor demand in the Caribbean basin. In *Mexican and Central American Population and US Immigration Policy,* ed. FD Bean, J Schmandt, S Weintraub, pp. 113–60. Austin, TX: Ctr. Mexican Am. Stud., Univ. Texas

Espenshade TJ. 1990. Undocumented migration to the United States: evidence from a repeated trials model. See Bean et al 1990, pp. 159–81

Espenshade TJ. 1992. Policy influences on undocumented migration to the United States. *Proc. Am. Philos. Soc.* 136(2):188–207

Espenshade TJ. 1994. Does the threat of border apprehension deter undocumented US immigration? *Popul. Dev. Rev.* 20 (4):871–92

Espenshade TJ. 1995. Using INS border apprehension data to measure the flow of undocumented migrants crossing the US-Mexico frontier. *Int. Migration Rev.* In press.

Espenshade TJ, Acevedo D. 1995. Migrant cohort size, enforcement effort, and the apprehension of undocumented aliens. *Popul. Res. Policy Rev.* In press

Espenshade TJ, Bean FD, Goodis TA, White MJ. 1990. Immigration policy in the United States: future prospects for the Immigration Reform and Control Act of 1986. In *Population Policy: Contemporary Issues,* ed. G Roberts, pp. 59–84. New York: Praeger

Espenshade TJ, Calhoun CA. 1993. An analysis of public opinion toward undocumented immigration. *Popul. Res. Policy Rev.* 12(3): 189–224

Espenshade TJ, Hempstead K. 1994. *Contemporary American Attitudes Toward US Immigration.* November, Princeton Univ. Unpublished manuscript

Espenshade TJ, King VE. 1994. State and local fiscal impacts of US immigrants: evidence from New Jersey. *Popul. Res. Policy Rev.* 13(3):209–40

Espenshade TJ, White MJ, Bean FD. 1991. Patterns of recent illegal migration to the United States. In *Future Demographic Trends in Europe and North America,* ed. W Lutz, pp. 301–36. London: Academic Press

Federation for American Immigration Reform. 1989. *Ten Steps to Securing America's Borders*. Washington, DC: FAIR

Fernandez EW, Robinson JG. 1994. *Illustrative Ranges of the Distribution of Undocumented Immigrants by State*. Washington, DC: Popul. Div., US Bur. Census

Fix M, ed. 1991. *The Paper Curtain: Employer Sanctions' Implementation, Impact, and Reform*. Washington, DC: Urban Inst.

Fix M, Passel JS. 1994. *Immigration and Immigrants: Setting the Record Straight*. Washington, DC: Urban Inst.

Harris JR, Todaro MP. 1970. Migration, unemployment, and development: a two-sector analysis. *Am. Econ. Rev*. 60(1):126–42

Harwood E. 1986. American public opinion and US immigration policy. *Ann. Am. Academy Polit. Soc. Sci*. 487:201–12

Heer DM. 1990. *Undocumented Mexicans in the United States*. New York: Cambridge Univ. Press

Huddle DL. 1993. *The Costs of Immigration*. Washington, DC: Carrying Capacity Network

Huddle DL, Corwin AF, MacDonald GJ. 1985. *Illegal Immigration: Job Displacement and Social Costs*. Alexandria, VA: Am. Immigration Control Found.

Keely CB. 1982. Illegal migration. *Sci. Am*. 246(3):41–47

Kossoudji SA. 1992. Playing cat and mouse at the US–Mexican border. *Demography* 29(2):159–80

Kossoudji SA, Cobb Clark DA. 1993. Finding good opportunities within undocumented markets: US occupational mobility for Latino workers. July, Univ. Mich. Unpublished manuscript

LaLonde RJ, Topel RH. 1991. Immigrants in the American labor market: quality, assimilation, and distributional effects. *Am. Econ. Rev*. 81(2): 297–302

Levine DB, Hill K, Warren R, eds. 1985. *Immigration Statistics: A Story of Neglect*. Washington, DC: Natl. Acad. Press

Los Angeles County. 1991. *Updated Revenues and Costs Attributable to Undocumented Aliens*. Los Angeles, CA: Chief Admin. Off.

Martin PL. 1986. *Illegal Immigration and the Colonization of the American Labor Market. CIS Paper No. 1*. Washington, DC: Ctr. Immigration Stud.

Massey DS. 1987. Do undocumented migrants earn lower wages than legal immigrants? New evidence from Mexico. *Int. Migration Rev*. 21(2):236–74

Massey DS. 1988. International migration and economic development in comparative perspective. *Popul. Dev. Rev*. 14(3):383–413

Massey DS. 1990. Social structure, household strategies, and the cumulative causation of migration. *Popul. Index* 56(1):3–26

Massey DS, Arango J, Hugo G, Kouaouci A, Pellegrino A, Taylor JE. 1993. Theories of international migration: a review and appraisal. *Popul. Dev. Rev*. 19(3):431–66

McCarthy KF, Valdez RB. 1986. *Current and Future Effects of Mexican Immigration in California, Report R-3365-CR*. Santa Monica, CA: RAND Corp.

Moehring HB. 1988. Symbol versus substance in legislative activity: the case of illegal immigration. *Public Choice* 57:287–294

Moreno-Evans M. 1992. *Impact of Undocumented Persons and Other Immigrants on Costs, Revenues and Services in Los Angeles County. A Report Prepared for Los Angeles County Board of Supervisors*, November 6. Los Angeles, CA: Internal Services Dep., Los Angeles County

Morris MD. 1985. *Immigration: The Beleaguered Bureaucracy*. Washington, DC: Brookings Inst.

Muller T, Espenshade TJ. 1985. *The Fourth Wave: California's Newest Immigrants*. Washington, DC: Urban Inst.

Myrdal G. 1957. *Rich Lands and Poor*. New York: Harper & Row

North DS, Houston MF. 1976. *The Characteristics and Role of Illegal Aliens in the US Labor Market: An Exploratory Study*. Washington, DC: Linton

Passel JS. 1986. Undocumented immigration. *Ann. Am. Acad. Polit. Soc. Sci*. 487:181–200

Passel JS. 1994. *Immigrants and Taxes: A Reappraisal of Huddle's 'The Cost of Immigrants'*. Washington, DC: Urban Inst.

Piore MJ. 1979. *Birds of Passage: Migrant Labor in Industrial Societies*. Cambridge: Cambridge Univ. Press

Rea LM, Parker RA. 1993. *Illegal Immigration in San Diego County: An Analysis of Costs and Revenues. Report to the California State Senate Special Committee on Border Issues*

Rothman ES, Espenshade TJ. 1992. Fiscal impacts of immigration to the United States. *Popul. Index* 58(3):381–415

Simon RJ. 1985. *Public Opinion and the Immigrant: Print Media Coverage 1880–1980*. Lexington, MA: Lexington

Simon RJ, Alexander SH. 1993. *The Ambivalent Welcome: Print Media, Public Opinion and Immigration*. Westport, CT: Praeger

Singer A, Donato K, Durand J. 1994. *The social process of border crossing: undocumented Mexican migrants to the United States*. Presented at Annu. Meet. Popul. Assoc. Am., Miami, Florida, May 5–7

Stark O. 1991. *The Migration of Labor*. Cambridge: Basil Blackwell

Stark O, Levhari D. 1982. On migration and risk in LDCs. *Econ. Dev. Cult. Change* 31: 191–96

Taylor JE. 1986. Differential migration, networks, information, and risk. In *Research in Human Capital and Development,* Vol. 4, *Migration, Human Capital, and Development,* ed. O Stark, pp. 147–71. Greenwich, CT: JAI

Todaro MP, Maruszko L. 1987. Illegal migration and US immigration reform: a conceptual framework. *Popul. Dev. Rev.* 13(1): 101–14

US Immigration and Naturalization Service. 1993. *Statistical Yearbook of the Immigration and Naturalization Service, 1992.* Washington, DC: US Govt. Print. Off.

Vialet J. 1989. *Brief History of United States Immigration Policy. Immigration and Nationality Act (as amended through January 1, 1989) with Notes and Related Laws.* Com. on Judiciary of the House of Representatives, April, 101st Congr., 1st sess., Ser. No. 2, pp. 413–33. Washington, DC: USGPO. 8th ed.

Wallerstein I. 1974. *The Modern World System, Capitalist Agriculture and the Origins of the European World Economy in the Sixteenth Century.* New York: Academic

Warren R. 1994. *Estimates of the Unauthorized Immigrant Population Residing in the United States, by Country of Origin and State of Residence: October 1992.* Presented Conf. on Calif. Immigration, April 29. Washington, DC: Statist. Div., Immigration and Naturalization Serv.

Warren R, Passel JS. 1987. A count of the uncountable: estimates of undocumented aliens counted in the 1980 United States Census. *Demography* 24(3):375–93

Weintraub S, Cardenas G. 1984. *The Use of Public Services by Undocumented Aliens in Texas: A Study of State Costs and Revenues.* Austin, TX: Lyndon B. Johnson School of Public Affairs

White MJ, Bean FD, Espenshade TJ. 1990. The US 1986 Immigration Reform and Control Act and undocumented migration to the United States. *Popul. Res. Policy Rev.* 9(2): 93–116

Woodrow KA. 1991. *Preliminary Estimates of Undocumented Residents in 1990. Demographic, Analysis Evaluation Project D2, 1990 Decennial Census, Preliminary Research and Evaluation Memo. No. 75.* Washington, DC: US Bur. Census

Woodrow KA, Passel JS. 1990. Post-IRCA undocumented immigration to the United States: an assessment based on the June 1988 CPS. See Bean et al 1990, pp. 33–75

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MODELING INTERNAL ORGANIZATIONAL CHANGE

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KEY WORDS: organizations, organizational theory

ABSTRACT

Organizational change can be usefully conceptualized in terms of both its process and its content. Process refers to how change occurs. Content describes what actually changes in the organization. Theories and analyses of organizational change seek to explain why organizations change as well as what the consequences are of change. Empirical evidence on both questions is fragmentary and occasionally contradictory. Models that consider both process and content show the greatest potential for resolving this situation. Such models can be used to test social science theories as well as to evaluate programs of organizational change promulgated by consultants and practitioners. Basic organizational theory would be enhanced by greater attention to organizational change.

ADAPTATION, SELECTION, AND ORGANIZATIONAL CHANGE

For the last 20 years or so, theory and research on organizations have been routinely separated into two major theoretical camps, depending on how malleable or flexible formal organizations are considered to be. The first camp consists of those whose efforts use an adaptational mechanism of organizational change. This mechanism assumes that change in the world of organizations occurs mainly through the adaptive responses of existing individual

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organizations to prior changes in technology, environment, or whatever. Theories typically placed in the adaptational camp include contingency theory (Woodward 1965, Lawrence & Lorsch 1967), resource dependence theory (Pfeffer & Salancik 1978, Burt 1983, 1992), institutional theory (Meyer & Rowan 1977, DiMaggio & Powell 1983), and transaction cost economics (Williamson 1975, 1985). The second camp coheres around a selectional mechanism of organizational change. It assumes that individual organizations cannot change easily and quickly; it also assumes that when they do change, great risks are entailed. By this view, when technologies and environments change, some existing organizations fail. Some different new ones also appear. The selective replacement of the old forms of organization by the new forms constitutes the main way this mechanism accounts for change in the world of organizations. Theories residing in this camp include organizational ecology (Hannan & Freeman 1977, 1989) and, on occasion, evolutionary economics (Nelson & Winter 1982).

Within each of these camps, we believe that most researchers hold a general sense of progress about the last two decades. Certainly, one can point to a number of theories of organization that have been developed extensively within this period and to a considerable amount of cross-fertilization. Yet, oddly enough, basic questions about the major sources and outcomes of change within individual organizations—the primary theoretical difference between the two camps—remain unanswered. While this neglect may have been useful for researchers single-mindedly attempting to develop a particular theory, it can scarcely be defended on general grounds. Selection theorists admit that individual organizations do sometimes successfully change, and adaptation theorists recognize that some organizations fail because they do not change when and how they should. In other words, the major difference between the two camps is a thoroughly researchable topic pertaining to the rates and conditions of change in individual organizations and the outcomes change generates.

Driven partly by this observation, a new and rapidly surging stream of research on organizational change and its outcomes has appeared. Led by T Amburgey (Kelly & Amburgey 1991, Amburgey et al 1993) and H Haveman (1992, 1993a), this research has moved quickly past primary distinctions such as adaptation and selection. Examining directly the phenomenon of organizational change (or its logical converse, inertia) and evaluating its consequences have led researchers to introduce and use a variety of conceptual ideas and modeling proposals. Most of these arise from knowledge and analysis of the particular industrial or institutional context under study. Insightful as these approaches may be within their contexts, it is important for the development of general theory on organizations that they be interpreted and evaluated at a more abstract level as well.

Accordingly, our main purpose here is to review and comment on the recent spate of research on organizational change and its outcomes. We focus mainly on those studies that adopt the organization as the unit of analysis and that either conceptualize change (or its obverse, inertia) as a dependent variable or explore the consequences of change on organizational outcomes. We do not deal at length with the many theories and studies that deal with change implicitly or as a secondary concern.

DIMENSIONS OF ORGANIZATIONAL CHANGE

Organizational change involves, by definition, a transformation of an organization between two points in time. For most analysts, the key aspect of change comes from comparing the organization before and after the transformation. Making such a comparison constitutes an analysis of the content of organizational change. It assesses what actually differs in the organization at the second point in time. On the basis of content, major changes consist of transformations that involve many elements of structure or those that entail radical shifts in a single element of structure.

A second dimension of organizational change concerns the way the transformation occurs—the speed, the sequence of activities, the decision-making and communication system, the resistance encountered, etc. Examining these factors involves a focus on the process of change per se. Process considerations may be independent of content, or they may be interactive. For instance, Gusfield's (1957) study of the Women's Christian Temperance Union looks at how the organization's objectives changed over time (content analysis). But Gusfield does so with an eye to how the demography of membership constrained the struggle over different directions (process analysis).

Enough research has been conducted on organizational change to make it clear that, in most contexts, both content and process factors ought to be evaluated. Yet theories and analyses of organizational change often tend to only one dimension. The game theory of modern industrial organization economics (Shapiro 1989), for example, usually involves very sophisticated analyses of the costs and benefits of a firm's potential future market positions. But game theory analyses typically assume implicitly that the risks and costs associated with moving to any of these positions is nil. On the other side of the issue, much management theory lays out communication systems and political frameworks (Pfeffer 1992) for implementing organizational transformations but ignores the possibility that different types of transformations may call for different approaches.

Organizational change is often considered a distinctive aspect of organizations, one requiring its own ideas and studies. Such arguments overlook the potential for using basic theories of organization to make predictions about change. Virtually every theory of organization contains an equilibrium prediction about optimal structure for a given set of technological and environmental conditions. When coupled with an adaptationist assumption of change (already used by most theories), this prediction essentially specifies—with proper translation and application to the context—a content prediction for change. For instance, a transaction costs analysis of wineries might suggest that for reasons of asset-specificity, boutique wineries without their own vineyards will move to integrate such assets. In general, reliance on basic theories of organization for the study of change may require significant effort in application but should serve to unify the field.

WHY DO ORGANIZATIONS CHANGE?

To some observers, asking "Why do organizations change?" seems dense. The obvious answer to many is that an organization changes when and how its managers decide it will. To organizational analysts, that answer merely restates the question in part. They ask whether there are any regular patterns in the ways managers decide to change organizations. Going further, organizational analysts recognize that attempts at organizational change often take unexpected turns and lead to transformations other than those intended (Merton 1936). They also realize that change sometimes occurs unintentionally as a by-product of other decisions and actions within the organization (March 1982, Burgelman 1994). For all these reasons, sociological research on why organizations change tends to focus on what actually happens to organizations over time, the transformations in content.

Internal Factors

The most well-known theories of how organizations change over time are based on a life-cycle or developmental metaphor (Greiner 1972, Child & Kieser 1981, Cafferata 1982, Kimberly & Miles 1980). These theories posit that as an organization grows, certain structural transformations should occur. For example, a well-accepted tenet in this vein is that entrepreneurial firms must, at some point in their growth or size, shift from direct and informal control by the owner-manager to a less personal formal control system (Lippitt & Schmidt 1967). Popular variants of these theories rely on the age of the organization or its products rather than on growth to predict structural change (Boswell 1973, Abernathy & Utterback 1978).

Most life-cycle theories of organizational change have been developed by looking retrospectively at the histories of a few large and successful organizations. Such evidence is highly biased, of course, and provides little support for these theories as causal—or even descriptive—models of organizational change.

More recent work also studies internal organizational change in terms of organizational age and size, but with more attention to the process of change. The most developed of these arguments—the so-called "structural inertia theory" of Hannan & Freeman (1984)—asserts that organizations become increasingly inert over time as procedures, roles, and structures become well-established (Barron et al 1994). This implies that the likelihood of organizational change decreases with an organization's age—a prediction that has received empirical support (Delacroix & Swaminathan 1991, Amburgey et al 1993, Halliday et al 1993, Miller & Chen 1994). Structural inertia theory also predicts that the likelihood of change increases once a change occurs, since the "clock" of inertia is essentially restarted when structures, roles, and procedures are regenerated in the process of change. This prediction has also been supported in its only full empirical test (Amburgey et al 1993).

Hannan & Freeman (1984) also argue that larger organizations would be less likely to change due to the bureaucratic structure that typically accompanies size. However, others contend that larger organizations may be more likely to change because of their greater access to resources (Kimberly 1976, Aldrich & Auster 1986). Empirical evidence on this issue is mixed: Some shows large organizations as more likely to change (Huber et al 1993), other studies find less change among larger organizations (Delacroix & Swaminathan 1991, Halliday et al 1993), and still other work finds medium-sized organizations as the most change-prone (Haveman 1993a).

External Factors

Much other recent research seeking to explain organizational change looks to the environment. It examines both institutional environments and market volatility. With institutions, for example, Miner et al (1990) find that, among Finnish newspapers, interorganizational affiliation with external political parties is positively associated with rates of organizational change. Singh et al (1991) show that the introduction of new governmental programs related to resources increases rates of change among social service organizations. Halliday et al (1993) document how state actions affect the likelihood of bar associations changing from a market to a governmental orientation. Haveman (1993b) finds that savings and loan associations tend to imitate large and profitable associations in making diversification moves. On volatility, Delacroix & Swaminathan (1991) discover a positive relationship between environmental market variability and product changes among California wineries. In studying the airline industry, Miller & Chen (1994) find that airlines are more likely to change when faced with a diverse and growing market.

Interesting as these and similar studies are, we believe that greater theoretical development on the external causes of organizational change would be beneficial. Currently, it seems to us that many theorists envision environments filled with opportunities, constraints, and examples of successful practice. They predict organizational action based on assessment of some combination of these. The logic of this approach parallels that of models of individual rational action and decision-making and thus carries the same limitations. For instance, it will always be possible to identify opportunities in retrospect, but that does not mean decisionmakers of the time were aware of them or able to identify them (March 1978). It is also difficult to assess opportunities and constraints in retrospect because organizational moves and their associated outcomes are already known.

Comparing the various studies raises another important question about organizational action. In some studies, such as Haveman's (1993b) analysis of savings and loans, organizations are implicitly assumed to be action-oriented, waiting for an attractive opportunity until they do so. In others, such as Halliday et al's (1993) analysis of state bar associations, the implicit assumption would seem to be inertia—organizations do not change until almost forced to do so by resource depletion or another crisis. Why should some organizations or some types of changes be pulled by opportunities and others be pushed by impending catastrophe? The theories do not explain.

One solution would be to pay greater attention to the processes within organizations by which environmental opportunities and constraints are assessed (O'Reilly et al 1993). For example, Ocasio (1995) presents evidence that environmental adversity triggers changes in chief executive officers (CEOs). He also finds that political processes facilitate change, an effect at odds with the received understanding of power as a source of inertia (Ocasio 1994).

Another solution would be to tie the study of organizational change more closely to theories of organizational environments. In fact, researchers working from the institutional perspective have made progress in this direction (Edelman 1990, Dobbin et al 1993). They show that, in response to vague new legal mandates, organizations and relevant professionals collectively define appropriate structural adjustments by organizations (Edelman 1992, Sutton et al 1994). The limited impact that this work has had so far on the study of organizational change probably has to do with its retrospectively defined samples, which likely generate biased estimates of effects of organizational age and size.

Perhaps the most vibrant vein of environmental research on organizational change looks at the process of technological change (Tushman & Romanelli 1985, Tushman & Anderson 1986, Anderson & Tushman 1990, Henderson & Clark 1990). Using a Schumpeterian perspective, this work combines the logic of structural inertia theory with attention to environmental constraints and opportunities. Researchers focus on the difficulties that established firms have in efficaciously adopting innovations, especially as compared to newly founded firms. They find that many innovations require new organizational capabilities and that these are often difficult to put in place (Tushman & Anderson 1986, Henderson & Clark 1990). The strength of organizational inertia and resistance to change varies, depending on an organization's strategy and structure (Zajac & Shortell 1989) and on the speed of environmental change (Eisenhardt 1989).

Finally, we note that competition resembles the forgotten relative in this context. No one denies his rights on the matter, but then no one invites him to dinner either. Knowledgeable readers should recognize that almost all those factors brought into analyses of organizational failure also tend to get incorporated into investigations of organizational change (the parallel naturally follows from the close relationship of change to failure in the adaptation-selection debate). Yet, the most widely used concept in failure studies—competition—gets short shrift in studies of change. Organizations may change because competitive pressures force them to do so. Similarly, they may change to avoid intensely competitive environments or to seek out or create less competitive domains, as Delacroix & Swaminathan (1991) assume occurred among California wineries. Direct investigation of these possibilities is needed.

How can competition be modeled in studies of organizational change? Organizational ecologists currently rely on two different general approaches to modeling competition. The first, due to Hannan & Freeman (1989), uses as independent variables measures of population structure such as organizational density (a count of the number of organizations characterized by a particular organizational form). Studies using these kinds of population structure measures (sometimes cast at the subpopulation level) include Barnett & Carroll (1987), Barnett (1990), Hannan & Carroll (1992), Greve (1994) and Barnett & Freeman (1994). The second approach, developed initially by McPherson (1983), conceives competition in terms of the specific location in resource space of individual organizations. This approach measures competition by estimating variables of multidimensional population microstructure. Studies using these kinds of measures include McPherson & Smith-Lovin (1988), Baum & Mezias (1992), and Baum & Singh (1994).

CONSEQUENCES OF ORGANIZATIONAL CHANGE

Theoretical Framework

Most contemporary studies of the consequences of organizational change build on the framework of Hannan & Freeman's (1984) structural inertia theory (reviewed in detail by Peli et al 1994). Hannan & Freeman argue that "core" structural change is precarious and leads to an elevated probability of organizational failure and death. Changes affecting the non-core or periphery structure do not produce the same outcome; they may even lead to a lowered risk of death.

What constitutes a core structural change? Hannan & Freeman (1984) give a hierarchical list of four core features, including an organization's mission, its authority structure, its technology, and its marketing strategy. The most fundamental structural change involves changing an organization's mission, next its authority structure, then its technology, and finally its marketing strategy. According to Hannan & Freeman (1984: 156), "although organizations sometimes manage to change positions on these dimensions, such changes are rare and costly and seem to subject an organization to greatly increased risks of death."

One commonly used way to interpret and generalize the list is to think of it in terms of the extensiveness of subsequent other changes in the organization implied by an initial change. That is, core changes imply extensive other changes in structures and routines throughout the rest of the organization. In analyzing diversification moves, similar logic leads to assessment of the relatedness of new activities to previous core structure. Hypotheses derived from this framework hold that the more extensive an organizational change, the more likely is organizational failure, and the more unrelated a diversification move, the more likely is organizational failure.

Empirical Studies

Table 1 provides a summary list of recent empirical studies investigating these arguments. Each of these studies examines a population of like organizations over a period of time, records their actions with respect to a particular type of structural change, and charts their subsequent fates. Effects of change are evaluated with hazard function models, which specify an organization-specific instantaneous rate of death r(t). Rate models are very useful in this context because they incorporate information on those organizations that do not fail (so-called censored cases). They also allow the researcher to control for differences in organizations and their environments, including organizational age (organizational death rates are typically duration-dependent).

By their stated interpretations, the majority of the studies shown in Table 1 support the basic prediction of structural inertia theory—death rates rise with core changes in organizational structure and with unrelated diversification efforts. For instance, Singh et al (1986) regard service area shifts as core changes and CEO successions and location shifts as peripheral changes. However, the pattern of findings is far from uniform. Several studies report strong effects of change contrary to Hannan & Freeman's predictions (those of Kelly & Amburgey 1991, Delacroix & Swaminathan 1991, and Haveman 1992 are interpreted this way).

The mixed pattern of findings can be accounted for by two types of incon-

Table 1 Summary of empirical studies of the effects of organizational change on mortality

Study	Organizational form	Type of change(s)	Effect on mortality
Carroll (1984)	Newspapers	Publisher succession	+
Singh et al (1986)	VSSOs	CEO succession	−
		Location shift	−
		Service area shift	+
Zucker (1987)	Hospitals	Technical and administrative changes	−
Freeman & Hannan (1990)	Semiconductor manufacturers	Product changes	+
Miner et al (1990)	Newspapers	Various	+
Kelly & Amburgey (1990)	Airlines	Market shift	−
Delacroix & Swaminathan (1991)	Wineries	Product addition	−
		Land acquisition	−
Haveman (1992)	Savings and loans	Diversification	−
Amburgey, Kelly & Barnett (1993)	Newpapers	Publication content	+
		Frequency	+
Barnett (1994)	Telephone companies	Technological change	+
Teo (1994)	Automobile manufacturers	V-8 engine production	−

sistencies across these studies. The first concerns the lack of strict logical separation between the change variable and the outcome variable. Although in principle every researcher would agree that independent and dependent variables must be logically unrelated, in practice the lines sometimes get blurred. Any major organizational change that likely occurs as a result of previous successful performance must be treated with caution in this context because its estimated effects will likely be confounded. An example of this type of potentially problematic "independent" variable can be found in Delacroix & Swaminathan's (1991) study of wineries, where land acquisitions and new product offerings are the organizational changes studied. A similar question arises in Zucker's (1987) study of hospitals, where changes are distinguished post hoc on the basis of attractiveness or rate of adoption by other hospitals.

A second, and perhaps more fundamental, problem concerns the difficulty of estimating separately the effects of change content and process. Hannan & Freeman's structural inertia argument about the deleterious consequences of change relies mainly on notions about the process of change per se—it disrupts routines, undermines relationships, requires learning, etc. Process effects of change are most pronounced immediately following the change; they then diminish gradually with duration from the change. To estimate such effects, it is necessary to peel away any effects of the content of the change, which may be either positive or negative. So, for instance, in a group of firms diversifying into unrelated areas, some may be moving into markets that are bountiful, while others are moving into sparse ones. If Hannan & Freeman are correct, all these firms should exhibit negative effects from the process of moving into unrelated markets (process effect of change). But if most are going into bountiful markets, then the beneficial returns of participation in such an environment (content effect of change) may overwhelm any simple test of the effects of diversification.

Modeling Issues

Figure 1 illustrates the distinction between content and process effects in more general terms. The two circles A and B represent the state space of a hypothetical organization; it can occupy either state at any given point in time. One can think of A and B as alternative strategies (e.g. low-cost production strategy versus upscale focus). In this depiction, r(A) refers to the failure rate associated with organizations of type A, while r(B) refers to the failure rate of organizations of type B. When an organization changes from type A to type B, the content effects of the change can be expressed as r(B) – r(A). This difference will be negative—meaning a lower failure rate—when the organization changes to a better (less hazardous) strategy. In addition to the content effect, there may also be a hazard associated with the process of changing from A to B. This is represented by r(ΔAB) in Figure 1—the hazard of failure due to organizational change per se. The total effect of changing from strategy A to strategy B, then, can be summarized as r(B) – r(A) + r(ΔAB). Obviously, the hazard r(ΔAB) could be substantial as predicted by structural inertia theory, and yet it might not be detected in empirical research if the content of change (r(B) – r(A)) produces strong beneficial effects.

How can content and process effects be separated? Unfortunately, a general formulation for all types of organizational changes has yet to appear. However, for organizational changes that can be represented as discontinuities or discrete events, the approach of Amburgey et al (1993) has proven very useful. It requires estimation of the model:

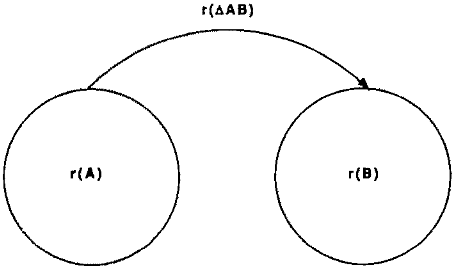

Figure 1 The content and process effects of organizational change from strategy A to strategy B.

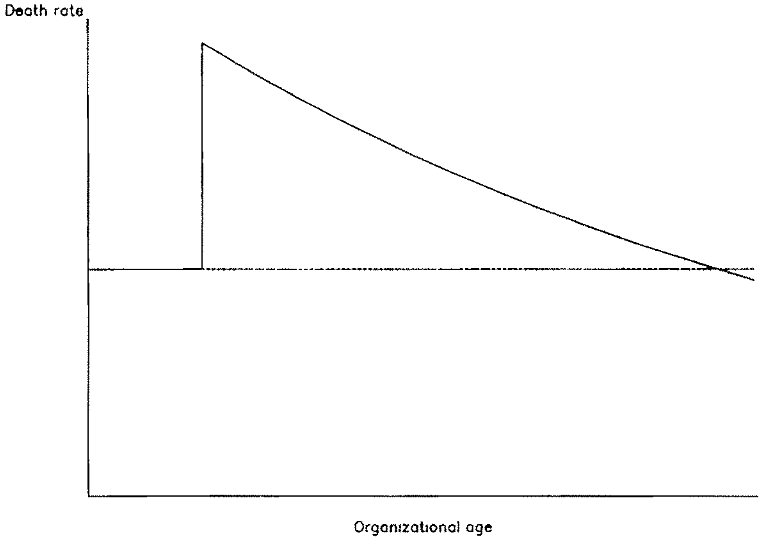

Figure 2 Predicted effect of organizational change on organizational mortality.

$$r_j(t) = \exp[\,\gamma t_j + \Theta 0' X_j + a(\Delta Z_j) + b\tau_j], \qquad 1.$$

where r is the instantaneous failure rate of organization j and t is its age, **X** are variables describing the state-space of organization j at time t, ΔZ is an indicator variable set equal to zero from the founding date of organization j until it engages in a major change, and τ is the backward-recurrence time since the last major change by organization j (set equal to 0 if no change has occurred for organization j). The model captures content changes with changes in the values of the covariates X. Process effects of change per se are represented by the terms $a(\Delta Z_j)$ and $b\tau_j$. Either type of effect might also interact with other covariates, including organizational age and size.

Within the context of model 1, structural inertia theory predicts $a > 0$ and $b < 0$. Figure 2 depicts these predicted effects. Here the vertical axis represents the organization-specific rate of death and the horizontal axis, organizational age. The solid line represents the trajectory of an organization's death rate, with the spike occurring due to a major organizational change at that point in time (of a magnitude governed by the coefficient a). This increased hazard then wears off, however, at a speed governed by the coefficient b. If this organization changes again, the predicted death rate would again spike up to a high level and slowly diminish.

Of those findings described in Table 1, in our opinion only Amburgey et al

(1993) and Barnett (1994) estimate the complete form of model 1. The Amburgey study analyzes how failure rates of Finnish newspapers respond to changes in the frequency of publication and target audience, controlling for the content effects of frequency and audience by using dummy variables. The Barnett study reports how technical change affects telephone company failure rates. That study controls for content effects using dummy variables for each technical alternative as well as technology-specific density variables. Both of these studies find change per se to be disruptive, as Hannan & Freeman (1984) predicted, although in Amburgey et al (1993), the effect interacts with organizational age (see Teo 1994 for a similar finding).

In the other studies, the reported effects of change likely mix content and process effects. However, estimation of the full model is not always possible. Among other things, the model requires that changes occur among identifiable and fully measured states. Otherwise, content effects of the different states cannot be completely controlled. An even stronger requirement of the model is that the organizational changes studied must be either repeatable or of more than one type (and yet comparable across repetitions or types). Otherwise, the state-space controls in X are identical to ΔZ.

When either of these conditions does not apply, the full model cannot be identified. For instance, models of CEO succession (Carroll 1984) do not allow a control for the "states" being changed. Likewise, when Delacroix & Swaminathan (1991) use, as a state-space variable, number of products rather than dummy variables for each type of product, the state-space information is not fully decomposed (cf Haveman 1992). In another example, models of changes that can be enacted only once, such as adoption of a single new technology (Teo 1994), do not allow for the effects of ΔZ to be estimated. However, none of these limitations precludes the estimation of $b\tau_j$, as demonstrated by Carroll (1984).

Theoretical Issues

Using model 1 to examine the consequences of organizational change requires a priori designation of important differences in the content of change. For some applications, including diversification into new markets, this may be a fairly straightforward exercise of simply distinguishing good practice from bad (movement into bountiful versus sparse markets). However, we believe that here, as with models explaining organizational change, researchers have barely tapped the reservoir of relevant knowledge found in basic organizational theory. Virtually all theories of organization contain potential predictions about which organizational configurations will do best in a given setting. But these theoretical ideas are rarely applied to conceptualize the content of change in studies of the kind under review here.

The lack of theoretically motivated content variables represents a missed opportunity to use studies of the effects of change for broader purposes. Whether or not Hannan & Freeman's structural inertia thesis bears out, it would be useful to know, when organizations in a particular context change their structures in the specific ways predicted by, say, transaction cost theory or institutional theory or resource dependence theory, whether this experience enhances performance and lowers death rates. Moreover, it may very well be that because of their magnitude these types of theoretically derived content effects (rather than those based on simple organizational and environmental characteristics) must be considered in order to get clean estimates of process effects.

Finally, we note that many studies of the effects of change fail to control for the competitive intensity of the environments that organizations face. Although this might seem a minor oversight, we believe it is central because of the hypotheses under investigation. When an organization faces strong competition, the consequences of making the "wrong" structural adjustment (content of change) will be much faster and more severe than when competition is weak. In fact, under little or weak competition there may be no negative repercussion of inappropriate organizational content. Competition may also determine the threshold at which disruption from change leads to lower survival chances, as demonstrated in Barnett (1994).

ORGANIZATIONAL OUTCOMES

The list of outcome variables that might be used in evaluating organizational change is potentially endless. Yet, if the research in this tradition is to avoid lapsing into a logical and empirical morass, some general criteria about what constitutes an appropriate outcome variable must be agreed upon.

We believe that if studies of organizational change are going to inform basic organizational theory, then a necessary first condition of any major outcome variable is that it be measurable at the organizational level. Our view is that if the consequences of organizational change are not detectable at the organizational level in a well-designed study, then the change does not have much bearing on organization theory. Changes that do not show an impact at the organizational level certainly would not live up to the normative uses to which they are often subjected.

A second criterion for outcome variables should be broad applicability. Many outcome measures used by researchers capture the particulars of an industry well but are too idiosyncratic to allow comparisons across populations. For instance, Zucker (1987) uses room occupancy rates as an outcome variable, a measure appropriate for hospitals but not most other industries.

Researchers often use as outcome variables financial ratios, such as return on assets (ROA) or return on investments (ROI). As with any ratio variable, problems of interpretation arise because changes in either the numerator or denominator likely have different substantive meanings, yet the net result on the ratio may be identical. Financial accounting measures are also known to be noisy, especially when compared across industries and long periods of time (Schmalansee 1989). However, when used to compare firms within an industry and across short periods, these variables present fewer problems.

More generally, Meyer & Gupta (1994) have noted the tendency for any performance-based outcome variable to "run down" as it gets used. That is, with sustained usage a wide variety of performance variables may lose their variability and hence no longer discriminate well between good and bad performance. According to Meyer & Gupta (1994:330), this running down occurs for a number of reasons, including: "positive learning where genuine improvement takes place, perverse learning where there is the appearance of improvement but not actual improvement, selection where poor performers... are displaced by better performers, and suppression where persistent differences in performance outcomes are ignored."

A major concern in investigating the effects of organizational change should be that researchers do not use methods or models that assume temporal equilibrium (e.g. cross-sectional regression models). After all, studying change virtually guarantees that organizations will not be in steady state (Carroll & Harrison 1994). When the outcome variables are continuous in nature, the linear partial adjustment model provides a good dynamic framework for modeling the effects of change without this assumption (see Tuma & Hannan 1984):

$$dY_j/dt = r(Y_j^* - Y_j). \qquad 2.$$

where Y denotes an observed continuous dependent variable, such as organizational performance, for organization j at a point in time. Y_j^* is the ultimate level of Y for organization j in steady-state equilibrium, and r is the rate of adjustment toward that equilibrium. Although Y_j^* is not observable, it can be specified as a function of observables in order to test hypotheses about the ultimate effects of change (Haveman 1992, Barnett et al 1994). Alternatively, studies focusing mainly on the process of change can test hypotheses in terms of r, since a lower rate of adjustment implies a more inert process of change. This can be done by estimating r either as a function of covariates (Baron et al 1991) or for different subpopulations of organizations (Freeman & Hannan 1975).

Besides not requiring the assumption of steady-state equilibrium, this model has several qualities that make it useful for the study of organizational change (Tuma & Hannan 1984). The parameters of the differential equation can be compared across studies, even when studies use different designs and cover different time periods. The model also is relatively easy to estimate. When expressed in terms of its associated integral equation, the model can be estimated using least squares techniques given time-varying data on organizations. These estimates can then be used to recover the parameters of the differential equation [although some opt to report only the coefficients of the integral equation, as in Haveman (1992)].

The bulk of change-outcome studies reviewed above in Table 1 use organizational failure or mortality as the outcome variable. This measure is admittedly an extreme one as far as performance is concerned, but it does have a number of attractions. First, mortality can be measured with a minimum of ambiguity and noise. Second, hazard function models—the usual modeling framework for investigating organizational mortality—provide for precise comparability across firms, industries, contexts, and research designs. Third, organizational mortality is one performance standard that it is difficult to envision becoming run down over time. Fourth, use of organizational mortality ensures a natural tie-in to many organizational theories because it pertains to the general adaptation-selection debate. For all of these reasons, modeling the effects of change on mortality will likely remain a popular outcome variable for assessing organizational change.

ORGANIZATIONAL PRACTICE

To this point, our review of organizational change and its outcomes has ignored management as well as highly visible directed change efforts such as Total Quality Management (TQM). This apparent omission does not reflect any hidden assumptions we have about the efficacy of managers. However, we believe that neither the actions of managers nor the components of change programs should be taken at face value. Instead, they should be critically analyzed and evaluated within the framework reviewed. For example, a TQM program in a company should be assessed in terms of both its organizational content and process relative to existing structure. For a group of such companies, TQM programs may differ, and these differences could be measured and used in assessing consequences.

The current fashion in management and policy circles involves emphasizing the role that organizational structures play in affecting work performance and then endorsing some regime of structured change to improve the world. The regimes are many and seemingly without end: TQM, re-engineering, and architecture, to name a few recent popular programs. Managers understand that the claims of the consultants behind these programs cannot be taken at face value. But, unfortunately, managers rarely put academics in position to pass judgment on program effectiveness using the research designs and models discussed in this chapter. Access to companies adopting change programs is highly limited, and this fact makes it exceedingly difficult for outside social scientists to obtain a satisfactory sample. Generally speaking, consultants do not want objective external assessments of their impact, and they maneuver to avoid it. What, if anything, can be done?

Although the idea sounds ludicrous at first, one suggestion would be for the government or some other authoritative body to regulate the sale and promotion of organizational regimes much like the Food and Drug Administration (FDA) does pharmaceutical drugs. That is, scientifically valid evidence regarding purported effects of a regime might be required from monitored clinical trials before it could be promulgated widely for profit. (Individual firms could, of course, continue to experiment at will.) The justification for such a drastic step could come not just from the revenues misspent on ineffective programs but from the potentially deleterious impact ill-designed programs could have on companies and individuals. If dispassionate university researchers can no longer engage in open social experimentation without peer review, then why should profit-oriented consultants be allowed to?

A compelling answer, of course, is that managers and companies not only voluntarily engage in such activities, but they actually pay for the opportunity to do so. Who better than they should know whether they are getting something worthwhile for their money? Indeed, some sophisticated managers with whom we have met and discussed these issues contend that they understand that organizational change programs rarely deliver on their explicitly stated goals. But they continue to use them nonetheless because they believe they help avoid complacency and because they often add value in unexpected ways. That is, these managers hold that the content of the program is beside the point—its existence and the attention it gets are the essential facts. This is an argument on behalf of Hawthorne effects, of course.

We find it interesting and even ironic that managers sometimes manage with Hawthorne effects in mind. We imagine that for such an approach to be effective, management cannot be so frank with its employees. Rather, we suspect that the content of the program must be publicly taken seriously, thus creating something like a confidence game between managers and employees.

Examining the scientific validity of such an approach would likely pose special research difficulties. In terms of the framework used here, the Hawthorne effects argument of managers posits a socially created, beneficial process effect of organizational change, a prediction exactly opposite of Hannan & Freeman's (1984) structural inertia theory. The studies of outcomes of change discussed above might be considered as tests of a simple version of this argument, except perhaps that no distinction between core and peripheral structure is needed. To evaluate a more sophisticated version of the argument would first require better conceptualization of exactly what produces the effect (is it management effort? leadership style? presentation and introduction methods? monitoring techniques?). And, because the causal force is likely to be a subtle set of actions or structures, significant measurement effort would likely be necessary.

Making a priori distinctions between the conditions for different types or strengths of process effects is a research strategy that might prove useful generally. Consider again Hannan & Freeman's (1984) structural inertia theory. Why should core changes, even if disruptive and deleterious, generate equal strength effects in all settings? The proposition flies in the face of much organizational knowledge. For instance, when an organization attempts to make a radical change in technological and marketing strategy by creating a new decentralized and semi-autonomous subunit (for example, General Motors and Saturn), the process effects should be less than when such a redirection entails reorienting an existing structure. Similarly, a major reorientation in an organization operated by consensual decision-making may take a long time to decide. But its rationale is likely to be better understood and its implementation is less likely to meet resistance than the same change undertaken in an organization with hierarchical autocratic decision-making. The general point is that as with organizational content, differences in process may matter for the outcome of a change. Moreover, although content and process effects are clearly distinct, there may very well be interactions between the two. We believe that when researchers start recognizing and incorporating such notions into studies of the consequences of organizational change, it will be easier to sort out findings and to resolve apparently contradictory ones.

CONCLUSION

Much extant theory of organizations addresses important questions of why organizations change and what outcomes change produces. As researchers increasingly use sound research designs and sophisticated modeling frameworks, progress in answering these questions will likely come quickly. If so, the answers they provide will be stimulating to both theorists and managers. Theorists will find reason to reexamine not only their notions about organizational change but also their basic understandings of organizations. Managers will likely learn some things that will help them, not simply in making their organizations more effective but even in preventing their demise.

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Literature Cited

Abernathy WJ, Utterback JM. 1978. Patterns of industrial innovation. *Tech. Rev.* 80:2–9

Aldrich HE, Auster ER. 1986. Even dwarfs started small: liabilities of age and their strategic implications. *Res. Organ. Behav.* 8: 165–98

Amburgey TL, Kelly D, Barnett WP. 1993. Resetting the clock: the dynamics of organizational failure. *Admin. Sci. Q.* 38:51–73

Anderson P, Tushman ML. 1990. Technological discontinuities and dominant designs: a cyclical model of technological change *Admin. Sci. Q.* 35:604–33

Barnett WP. 1990. The organizational ecology of a technological system. *Admin. Sci. Q.* 35:31–60

Barnett WP. 1994. The liability of collective action: growth and change among early telephone companies. In *Evolutionary Dynamics of Organizations*, ed. JAC Baum, JV Singh, pp. 337–54. New York: Oxford

Barnett WP, Carroll GR. 1987. Competition and mutualism among early telephone companies. *Admin. Sci. Q.* 38:51–73

Barnett WP, Freeman J. 1994. *Do the most competitive firms survive?* Presented at Annu. Meet. Acad. Manage. 54, Dallas, TX

Barnett WP, Greve HR, Park DY. 1994. An evolutionary model of organizational performance. *Strategic Manage. J.* 15: In press

Baron JN, Mittman BS, Newman AE. 1991. Targets of opportunity: organizational and environmental determinants of gender integration within the California Civil Service, 1979–1985. *Am. J. Sociol.* 96:1362–401

Barron DN, West E, Hannan MT. 1994 A time to grow and a time to die: growth and mortality of credit unions in New York, 1914–1990. *Am. J. Sociol.* 100:381–421

Baum JAC, Mezias SJ. 1992. Localized competition and organizational failure in the Manhattan hotel industry, 1898–1990. *Admin. Sci. Q.* 37:580–604

Baum JAC, Singh JV. 1994. Organizational niches and the dynamics of organizational mortality. *Am. J. Sociol.* 100:346–80

Boswell J. 1973. *The Rise and Decline of Small Firms*. London: Allen & Unwin

Burgelman RA. 1994. Fading memories: a process theory of strategic business exit in dynamic environments. *Admin. Sci. Q.* 39: 24–56

Burt RS. 1983. *Corporate Profits and Cooptation*. New York: Academic

Burt RS. 1992. *Structural Holes*. Cambridge: Harvard Univ. Press

Cafferata GL. 1982. The building of democratic organizations: an embryological metaphor. *Admin. Sci. Q.* 27:280–303

Carroll GR. 1984. Dynamics of publisher succession in newspaper organizations. *Admin. Sci. Q.* 29:93–113

Carroll GR, Harrison JR. 1994. On the historical efficiency of competition between organizational populations. *Am. J. Sociol.* 100: 720–49

Child J, Kieser A. 1981. Development of organizations over time. In *Handbook of Organizational Design*, ed. W Starbuck, P Nystrom, 1:28–64. New York: Oxford

Delacroix J, Swaminathan A. 1991. Cosmetic, speculative and adaptive change in the wine industry: a longitudinal study. *Admin. Sci. Q.* 36:631–61

DiMaggio PJ, Powell WW. 1983. The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. *Am. Sociol. Rev.* 48:147–60

Dobbin F, Sutton JR, Meyer JW, Scott WR. 1993. Equal opportunity law and the construction of internal labor markets. *Am. J. Sociol.* 99:396–427

Edelman L. 1990. Legal environments and organizational governance: the expansion of due process in the American workplace. *Am. J. Sociol.* 95:1401–40

Edleman L. 1992. Legal ambiguity and symbolic structures: organizational mediation of civil rights law. *Am. J. Sociol.* 97:1531–76

Eisenhardt KM. 1989. Making fast strategic decisions in high-velocity environments. *Acad. Manage. J.* 32:543–76

Freeman J, Hannan MT. 1975. Growth and decline processes in organizations. *Am. Sociol. Rev.* 40:215–28

Greiner LE. 1972. Evolution and revolution as organizations grow. *Harvard Bus. Rev.* 50 (July-Aug):37–46

Greve HR. 1994. *Patterns of competition: the diffusion of strategy adoption and abandonment.* PhD thesis. Stanford Univ., Stanford, CA

Gusfield JR. 1957. The problem of generations in an organizational structure. *Soc. Forc.* 35: 323–30

Halliday TC, Powell MJ, Granfors MW. 1993. After minimalism: transformations of state bar associations from market dependence to state reliance, 1918 to 1950. *Am. Sociol. Rev.* 58:515–35

Hannan MT, Carroll GR. 1992. *Dynamics of Organizational Populations*. New York: Oxford

Hannan MT, Freeman J. 1977. The population ecology of organizations. *Am. J. Sociol.* 82: 929–64

Hannan MT, Freeman J. 1984. Structural inertia and organizational change. *Am. Sociol. Rev.* 49:149–64

Hannan MT, Freeman J. 1989. *Organizational Ecology*. Cambridge: Harvard

Haveman H. 1992. Between a rock and a hard place: organizational change and performance under conditions of fundamental environmental transformation. *Admin. Sci. Q.* 37:48–75

Haveman H. 1993a. Organizational size and change: diversification in the savings and loan industry after deregulation. *Admin. Sci. Q.* 38:20–50

Haveman H. 1993b. Follow the leader: mimetic isomorphism and entry into new markets. *Admin. Sci. Q.* 38:593–627

Henderson RM, Clark KB. 1990. Architectural innovation: the reconfiguration of existing product technologies and the failure of established firms. *Admin. Sci. Q.* 35:9–30

Huber GP, Sutcliffe KM, Miller CC, Glick WH. 1993. Understanding and predicting organizational change. In *Organizational Change and Redesign*, ed. GP Huber, WH Glick, pp. 215–63. New York: Oxford

Kelly D, Amburgey TL. 1991. Organizational inertia and momentum: a dynamic model of strategic change. *Acad. Manage. J.* 34:591–612

Kimberly J. 1976. Organizational size and the structuralist perspective: a review, critique and proposal. *Admin. Sci. Q.* 21:571–97

Kimberly J, Miles RH. 1980. *The Organizational Life Cycle* San Francisco: Jossey-Bass

Lawrence PR, Lorsch JW. 1967. *Organization and Environment: Managing Differentiation and Integration*. Boston: Harvard Grad. Sch. Bus. Admin.

Lippitt GL, Schmidt WH. 1967. Crises in a developing organization. *Harvard Bus. Rev.* 45:102–12

March JG. 1978. Bounded rationality, ambiguity, and the engineering of choice. *Bell J. Econ.* 9:587–608

March JG. 1982. Footnotes on organizational change. *Admin. Sci Q.* 26:563–97

McPherson JM. 1983 An ecology of affiliation. *Am. Sociol. Rev.* 48:519–32

McPherson JM, Smith-Lovin L. 1988. A comparative ecology of five nations: testing a model of competition among voluntary organizations. In *Ecological Models of Organizations*, ed. GR Carroll, pp. 85–110, Cambridge: Ballinger

Merton RK. 1936. The unanticipated consequences of purposive social action. *Am. Sociol. Rev.* 1:894–904

Meyer JW, Rowan B. 1977. Institutionalized organizations: formal structures as myth and ceremony. *Am. J. Sociol.* 83:340–63

Meyer MW, Gupta V. 1994. The performance paradox. *Res. Organ. Behav.* pp. 309–69

Miller D, Chen MJ. 1994. Sources and consequences of competitive inertia: a study of the US airline industry. *Admin. Sci. Q.* 39:1–23

Miner AS, Amburgey TL, Stearns TM. 1990. Interorganizational linkages and population dynamics: buffering and transformational shields. *Admin. Sci. Q.* 35:689–713

Nelson RR, Winter SG. 1982. *An Evolutionary Theory of Economic Change*. Cambridge: Harvard

Ocasio WC. 1994. Political dynamics and the circulation of power: CEO succession in US industrial corporations, 1960–1990. *Admin. Sci. Q.* In press

Ocasio WC. 1995. The enactment of economic adversity: a reconciliation of theories of failure-induced change and threat-rigidity. *Res. Organ. Behav.* 17: In press

O'Reilly CA, Snyder RC, Boothe JN. 1993. Effects of executive team demography on organizational change. In *Organizational Change and Redesign*, ed. GP Huber, WH Glick, pp. 147–175. New York: Oxford

Peli G, Masuch M, Bruggeman J, Nuallain OB. 1994. A logical approach to formalizing organizational ecology. *Am. Sociol. Rev.* 59: 571–93

Pfeffer J. 1992. *Managing with Power*. Boston: Harvard Bus. Sch.

Pfeffer J, Salancik GR. 1978. *The External Control of Organizations*. New York: Harper & Row

Schmalansee R. 1989. Interindustry studies of structure and performance. In *Handbook of Industrial Organization*, ed. R Schmalvansee, R Willig, 2:952–1009. Amsterdam: Elsevier

Shapiro C. 1989. The theory of business strategy. *RAND J. Econ.* 20:125–37

Singh JV, House RJ, Tucker DJ. 1986. Organizational change and organizational mortality. *Admin. Sci. Q.* 31:587–611

Singh JV, Tucker DJ, Meinhard AG. 1991. Institutional change and ecological dynamics. In *The New Institutionalism in Organizational Analysis*, ed. WW Powell, PJ DiMaggio. Chicago Univ. Chicago Press

Sutton JR, Dobbin F, Meyer JW, Scott WR. 1994. The legalization of the workplace. *Am. J. Sociol.* 99:944–71

Teo ACY. 1994. *Innovation and firm longevity: the experience of American automakers,* *1880 to 1982*. PhD thesis. Univ. Calif., Berkeley

Tuma NB, Hannan MT. 1984. *Social Dynamics*. Orlando: Academic

Tushman ML, Anderson P. 1986. Technological discontinuities and organizational environments. *Admin. Sci. Q.* 31:439–65

Tushman ML, Romanelli E. 1985. Organizational evolution: a metamorphosis model of convergence and reorientation. *Res. Organ. Behav.* 7:171–222

Williamson OE. 1975. *Markets and Hierarchies*. New York: Free

Williamson OE. 1985. *The Economic Institutions of Capitalism*. New York: Free

Woodward J. 1965. *Industrial Organization*. London: Oxford

Zajac EJ, Shortell SM. 1989. Changing generic strategies: likelihood, direction, and performance implications. *Strategic Manage. J.* 10: 413–30

Zucker LG. 1987. Normal change or risky business: institutional effects on the 'hazard' of change in hospital organizations, 1959–1979. *J. Manage. Stud.* 24:671–700

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RAGS TO RAGS: Poverty and Mobility in the United States

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ABSTRACT

Early arguments over the "culture of poverty" assumed considerable intergenerational transmission of poverty but differed over whether this was due to cultural inadequacies of the poor or to structural barriers and discrimination faced by the poor. These arguments subsided by the 1970s when quantitative social stratification studies such as Blau & Duncan (1967) found that intergenerational socioeconomic mobility was considerable and that there was little evidence for a "vicious cycle of poverty." In the 1980s the issue of intergenerational poverty reemerged when research on new longitudinal datasets suggested that both intragenerational and intergenerational poverty were more persistent than analyses based on cross-sectional data had suggested. Four new theoretical perspectives were developed to explain intergenerational poverty: the resources model, the correlated disadvantages model, the welfare culture model, and Wilson's (1987) underclass model. This review summarizes and evaluates recent empirical research on the extent to which being raised in poor families, in non-intact families, in welfare-dependent families, and/or in underclass neighborhoods facilitates or hinders children's adult attainments. The review assesses how well each of the four new models are supported by this research.

INTRODUCTION

The question of whether poverty is passed on from parents to children is an enduring theme in the poverty literature. If poverty were sufficiently intergenerational, this would violate the US ideal of equal opportunity, i.e. that a young adult's economic destination should not be predetermined by his or her social origins.

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In the early culture-of-poverty debate which raged from the late 1950s to the late 1960s, both sides assumed that poverty was intergenerational but disagreed over why this was so (Patterson 1986). Advocates of the culture of poverty argument asserted that the poor lived in a different culture than did the rest of society, that this culture was characterized by deviant values and behaviors, and that this culture was both "familial and intergenerational" (Patterson 1986: 119). According to Oscar Lewis (1968:50), who in his book *La Vida* introduced the notion of a culture of poverty: "Once it [the culture of poverty] comes into existence, it tends to perpetuate itself from generation to generation because of its effects on children." Michael Harrington, a prominent advocate of the culture of poverty theory, warned that "There is a very real possibility that many, even most of the children of the poor will become the fathers and mothers of the poor. If that were to take place then Americans... would have a hereditary underclass" (Patterson 1986:119).

Critics of the culture of poverty did not dispute the existence of intergenerational poverty. Rather they argued that it was not due to the transmission of cultural deficiencies from parents to children. Elliot Liebow, for instance, argued that intergenerational poverty "stemmed from racial discrimination and lack of opportunities that affected individuals in each new generation" (Patterson 1986:123).

STATUS ATTAINMENT RESEARCH

In the late 1960s and the 1970s, quantitative sociologists began to question the assumption that children's adult status depended strongly on their parents' status. Blau & Duncan (1967) were the first to use multivariate statistical models to investigate the extent to which men's occupational status depended on their family background. They analyzed the 1962 Occupational Changes in a Generation Survey (OCG), a national survey of prime-age men. They found that parental status had only a moderate association with sons' occupational status, that most of that association operated via years of schooling, and that schooling was a much more powerful predictor of men's occupational status than was their demographic background. This led Blau & Duncan to reject the hypothesis that there was a "vicious cycle of poverty" for the general population.[1]

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[1] I am grateful to Paula England and Robert Hauser for pointing out that a background, indirect effect on attainment via schooling does not necessarily mean that one can reject the "cycle of poverty" model and accept a "merit" story. Which story is correct will depend both on the size of background effect and on why background affects schooling. If, for instance, parents who are not poor can buy more and better schooling for their children than do poor parents, some would argue that, for the poor children, this represents inheritance of poverty.

This same pattern of results continued when other researchers extended Blau & Duncan's (1967) work to include new datasets, additional background measures, more mediating variables (rank in class, social support, aspirations), and new dependent variables (i.e. measures of income) (Duncan et al 1972, Jencks et al 1972, Sewell & Hauser 1975, Featherman & Hauser 1978, Hauser & Featherman 1977, Jencks et al 1979). Furthermore, Hauser & Featherman (1978:234) found that the effects of family background on status were declining over time, and they suggested that "socioeconomic background and social ascription weigh less heavily in the socioeconomic careers of working men in the early 1970s than was the case in ...1962." Many interpreted these results as evidence that there was no culture of poverty in the United States (Patterson 1986).

One intriguing finding in the subsequent research suggested that the early status attainment research, which typically measured parental socioeconomic status by parents' schooling and occupations, might have missed an important variable—parental income. Sewell & Hauser (1975) found that higher levels of parental income (a four year measure from tax records) was associated with higher earnings of young adults, in a sample of male high school graduates, even after controlling for schooling and test scores. Unfortunately this sample included few nonwhites and excluded high school dropouts, and so does not provide a good test of the culture-of-poverty hypothesis.

At the same time that Blau & Duncan (1967) rejected the notion that poverty was hereditary in the general population, they and others argued that economic problems due to race could be inherited. Duncan (1968) showed that, even after background and schooling were controlled, the occupations of nonwhites had much lower prestige than did those of whites, that the absolute size of the race-based status differential increased with schooling, and that the correlation between fathers' and sons' occupational statuses was lower for nonwhites than for whites. Subsequent analyses also reported persistent race-based status differentials, even with background and schooling controlled (Duncan et al 1972, Hauser & Featherman 1977, Jencks et al 1979). These results supported Liebow's contention that discrimination was an important source of race-based intergenerational status inequality. There was cause for optimism, however. Hauser & Featherman (1977) analyzed the OCG and the 1972 replication of the OCG and showed that race-based status differentials and race-based differences in the effects of parental status on sons' status declined in the 1960s and early 1970s; they concluded that status attainment processes for nonwhites and whites were becoming more alike.

By the 1970s, the concept of an intergenerational culture of poverty no longer dominated academic discussions. Henry Aaron claimed that "the debate between the cultural and environmental view of poverty seems to have vanished without leaving significant intellectual residue" (Patterson 1986: 124).

Wilson (1987) argued that cultural issues disappeared from the poverty research agenda largely because liberals abandoned the field due to the fierce controversy that surrounded the 1965 Moynihan *Report on the Negro Family.*[2] Yet journalistic and popular accounts of poverty never totally abandoned the idea of intergenerational cultural transmission of poverty (e.g. Auletta 1982).

Nor was it clear that the early status attainment research had definitively answered some key questions about intergenerational poverty. Although Blau & Duncan (1967) explicitly raised and dismissed the issue of a "vicious cycle of poverty," their analyses and those of subsequent researchers focused primarily on overall rates of social mobility in the society as a whole, not on the extent of intergenerational poverty (Winship 1992). Their findings are consistent with the case where a subset of poor families was permanently stuck in poverty (for either cultural or structural reasons), while the rest of society was mobile.

Also the early status attainment research was structured in ways that ignored important dimensions of intergenerational poverty. This research focused primarily on men, especially white, employed men (Winship 1992). Yet female-headed families, nonwhites, and the jobless are those most likely to experience long-term poverty (Duncan et al 1984, Corcoran et al 1985, Bane & Ellwood 1986). Winship (1992) notes that researchers rarely if ever estimated effects of parental poverty, parental nonwork, parental welfare use, underclass neighborhoods, or labor market conditions on sons' socioeconomic mobility, and that researchers' models of family structure effects were often simplistic and static (see, for instance, Blau & Duncan 1967, Duncan et al 1972, Jencks et al 1972, Jencks et al 1979, Featherman & Hauser 1978, Hauser & Featherman 1977).

These gaps were due in part to the lack of available data on national samples of black and white families, a gap that would begin to be filled as the Panel Study of Income Dynamics (PSID), begun in 1968, annually followed 5000 families and their offspring. As new longitudinal data and new research methods were developed, results from three bodies of research—studies of intragenerational poverty and welfare recipiency, sibling correlation studies, and studies estimating the father-son correlation in long-run income—found that the early status attainment literature's reliance on cross-sectional data and on retrospective reports of background had ignored important distinctions between long-term and short-term poverty, had underestimated the overall impact of background advantages on sons' economic attainments, and had underestimated the intergenerational transmission of income levels from fathers to sons. Sibling research on sisters also indicated a strong overall impact of background on daughters' welfare participation.

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[2] Moynihan (1965) linked blacks' social problems—joblessness, illegitimacy, juvenile delinquency—to increasing rates of female headship in black families. Critics accused Moynihan of stigmatizing blacks, "blaming the victim," and ignoring the consequences of societal racism. Wilson (1987) claimed that this controversy led liberal scholars to avoid discussing behavioral issues that might be construed as unflattering to minorities, and that, as a result, by the 1980s conservatives dominated intellectual discussions of behavioral problems and poverty.

A number of researchers used the PSID to show that the poor and welfare recipients are heterogeneous groups. A large minority of the population will be poor or use welfare at some point in their lives, but for many of them, poverty and welfare use last only a few years. For a small proportion of the entire population, but for a substantial proportion of those who are ever poor or receive welfare, poverty and welfare use last for many years (Stevens 1994, Gottschalk & Moffitt 1994, Bane & Ellwood 1986, 1994). Moreover, the long-term poor are disproportionately black and likely to reside in female-headed families. One implication of these results is that research based on cross-sectional data may confound effects of short-run and long-run welfare use, and thus underestimate the intergenerational consequences of being raised in persistently poor and welfare-dependent homes.

Beginning with Blau & Duncan (1967), researchers have used the resemblance between brothers' economic statuses to measure the overall impact of background on men's economic outcomes. They have found that brothers' occupational statuses and earnings were much more alike than had been predicted by the early stratification research.[3] Hauser & Sewell (1986) reported that 40% of the variance in brothers' occupational status could be explained by brothers' shared background, while Solon et al (1991) reported that 45% of the variance in brothers' long-run earnings could be explained by brothers' shared background. These numbers are large compared to R^2 (the proportion of variance explained) reported in the early status attainment research. Featherman & Hauser (1978) reported, using the 1962 and 1973 OCG surveys, that measured background variables accounted for 20–25% of the variance in men's occupational statuses and 8–13% of variance in men's earnings.

Solon et al (1988) used the PSID longitudinal data to estimate the sister-sister correlation in welfare recipiency (defined as ever receiving welfare between the time of leaving home and age 27 years). They estimated a woman's probability of receiving welfare was .20 if her sister had not received welfare, but .66 if her sister did receive welfare. The large, significant difference between these two conditional probabilities, .46, is evidence of strong background effects on women's welfare receipt.

Recent longitudinal estimates of father-son correlations on income and earnings were much higher than those estimated in previous research. For example, Behrman et al (1985) estimated the father-son correlation in the logarithm of single year earnings to be 0.2 or less, while Solon (1992), using

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[3] See Solon et al (1991) and Corcoran (1992) for summaries of the sibling research on economic outcomes.

PSID data and multi-year measures of father's income, estimated the father-son correlation in long-run income to be at least 0.4. Altonji & Dunn (1991) and Zimmerman (1992) obtained estimates similar to Solon's using longitudinal data from the National Longitudinal Survey of Youth (NLSY).

RECENT MODELS OF THE INTERGENERATIONAL TRANSMISSION OF POVERTY

At the same time that researchers were utilizing longitudinal data to study both the intragenerational persistence of poverty and welfare dependency and the intergenerational transmission of income status, public dissatisfaction with continuing high poverty rates and expanding welfare rolls increased. Some (e.g. Murray 1984) even argued that the high poverty rates were caused by well-intentioned government programs that "trapped" the poor in a cycle of persistent poverty and welfare dependency. The issue of intergenerational transmission of poverty took center stage, and much attention was focused on the emergence of an underclass and on intergenerational welfare dependency (Auletta 1982, Corcoran et al 1985, Wilson 1987, 1993, Kane 1987, McLanahan 1988, Mead 1986, 1992, Loury 1981, Jencks & Peterson 1991, Mincy 1994). While terminology differs somewhat (i.e. the "underclass" replaced "culture of poverty" as the key term), the focus of recent studies is similar to the earlier ones in that family resources and structure, culture, community, and economic structure all play important roles. They differ, however, in important ways (Ellwood 1987). First, the new studies are more explicit about which parental and neighborhood disadvantages restrict children's opportunities and about how this process works. Second, some new structural arguments focus more on changes in labor market demand conditions and industrial restructuring that have affected all low-skilled workers and less on racial discrimination. Third, the new cultural arguments see government social policies as a major facilitator of deviant cultural values. Fourth, some analysts explicitly specify interactions among structural and cultural forces, thus moving beyond the simplistic culture-vs-structure dichotomies of the past.

The first structural argument emphasizes the lack of material resources. According to Becker (1981), parents allocate income between current consumption and investments in children's human capital (e.g. schooling). Because poor families are constantly in economic crisis, these families must concentrate on survival: They have little time, money, or energy to devote to developing children's human capital or earnings potential, have little time for supervising children, and are less plugged into job finding networks (Becker 1981, 1993, Wilson 1987). Similarly, poor parents can afford housing only in disadvantaged neighborhoods that provide lower quality schools, fewer good role models, less social control, and fewer job networks, and they are more likely to be beset by teenage gangs and high crime rates (Jencks & Mayer 1990, Loury 1981, Coleman 1990). Loury (1981) and Massey (1990) further argue that the problem of being able to buy neighborhood resources for one's children (i.e. to increase children's "social capital") is exacerbated for minority parents who (either because of tastes or discrimination) have access to far fewer neighborhoods than do nonminorities.

If parental material resources are a major source of intergenerational poverty, then the policy solution is straightforward: Provide more economic resources to poor families and to poor children, and enable poor families to buy into "better neighborhoods." This could be accomplished through earned income tax credits, refundable child care tax credits, housing vouchers, job opportunities programs, etc (Rosenbaum 1991).

The second argument is really a correlated disadvantages argument—i.e. it is not parental poverty per se, but other parental disadvantages that are associated with or cause parental poverty that keep children mired in poverty (Haveman et al 1991). For instance, poor parents have less schooling, on average, than do non–poor parents, and they may be less effective in developing their children's human capital (Becker 1981). Here, policy interventions should focus directly on improving schooling and school outcomes for children.

Similarly, poor families are more likely to be headed by a female than are non–poor families. Holding income and poverty status constant, children raised in families headed by a woman have higher rates of high school dropout, teen pregnancy, and joblessness. This family structure effect may be due to the psychological distress from losing a parent, to reduced involvement of the noncustodial parent, to reduced parental supervision, or to the absence of good role models for work and marriage (McLanahan & Sandefur 1994). In this case, poverty policies that try to support the nuclear family or address the distress and lack of role models in single-parent families may be useful.

Herrnstein & Murray's (1994) argument that cross-generational genetically based intelligence differences fuel intergenerational poverty and dependency (as well as a host of other undesirable outcomes) is also a correlated disadvantages model. This model rests on two premises: that low intelligence is a primary cause of poverty and dependency, and that intelligence has a large genetic component.[4] In this model, low IQs cause parental poverty; poor children are likely to inherit their parents' low IQs; and these children's low IQs, in turn, cause the children to be poor as adults. Herrnstein & Murray (1994) further claim that compensatory preschool and educational programs have not been able consistently to increase cognitive skills, and they conclude by arguing that social policies are unlikely to make much headway against intergenerational poverty. Herrnstein & Murray (1994: 548) urge that all welfare policies and services for low-income women who have babies be ended: They claim that US current social policy "subsidizes births among poor women, who are also disproportionally at the low end of the intelligence distribution."

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[4] The argument cited above is only one part of a very broad model outlined by Herrnstein & Murray (1994) about the role intelligence plays in American life. That model is based on four premises: 1. Intelligence is a single attribute that is measured by IQ tests; 2. intelligence has a large hereditary component within racial groups; 3. intelligence is a primary cause of many outcomes—education, income, employment, welfare use, parenting, crime; and 4. we do not know how to raise people's IQ's. The authors add an implicit fifth premise: Racial gaps in IQ are large and are likely partly genetically based. Each of these premises is currently the subject of a lively academic and popular debate.

If it were the case that poverty was simply a proxy for some other disadvantage, then that disadvantage must be identified so that appropriate policy solutions can be developed. It is simple theoretically, but difficult practically, to identify, isolate, and measure all possible disadvantages correlated with parental poverty that might constrain children's ability to escape poverty as adults. Unmeasured parental values, health conditions, and abilities are likely to constrain both parents' own economic attainments and their abilities to increase their children's adult productivity.

The third argument, the "welfare culture" model, like the earlier "culture of poverty" model, emphasizes deviant values, attitudes, and behaviors, but contends that these deviant values, attitudes, and behaviors are fueled by the government welfare system (Mead 1986, 1992). According to the welfare culture argument, when parents and neighbors rely heavily on welfare, the stigma associated with being on welfare disappears; parents and neighbors develop self-defeating work attitudes and poor work ethics; and these attitudes are passed on to their children. In addition, parental welfare recipiency provides children with poor role models for work and marriage. Girls raised in welfare-dependent homes and communities are more likely to drop out of high school, to have illegitimate births, and to go on welfare themselves. Boys raised in welfare-dependent homes and communities are more likely to grow up to father children out of wedlock, to drop out of high school, to hang out, engage in crime, and avoid regular work. Implicit in this welfare culture story is the assumption that welfare receipt changes parents', neighbors' and children's values, attitudes, and behaviors. Parents, neighborhood residents, and children eventually become "trapped" in poverty and dependency because of their deviant values and dysfunctional behaviors. Time limits on welfare or totally eliminating welfare would be good solutions here, since welfare itself is the culprit.

Note that it is very difficult to distinguish the "cultural story" from a "structural" one that posits that the poor economic prospects and constraints on the parents were the factors that brought about the negative attitudes and behaviors of the parents and that the children are affected by the same adverse economic environment (Kane 1987). In this structural story, parental and child welfare recipiency and disadvantages are effects and are not causal factors.

Murray (1984) also argues that welfare "traps" recipients, but he frames the issue as one of economic incentives. He contends that welfare offers both parents and their children viable alternatives to work and marriage. He further argues that welfare programs reduce the benefits of low wage work relative to no work and so reward those who don't "play by the rules" (i.e. who have children out of wedlock and do not work) and penalize those who do "play by the rules."

The earlier cultural and structural models held that poor communities were alienated from mainstream society, but the models never articulated exactly what were the key neighborhood factors that inhibited children's economic mobility. Wilson (1987, 1993) proposes a more fully specified structural model of neighborhood "social isolation." Wilson claims that the loss of well-paying manufacturing jobs that employed many less educated blacks from inner cities and the outmigration of middle class blacks from urban poverty areas together reduce the chances of the remaining impoverished residents and their children of escaping poverty. First, industrial restructuring and the shift of manufacturing employment from the cities to the suburbs mean that the number of jobs compatible with ghetto residents' skills and available to them has dropped. This increases male unemployment, reduces the pool of employed men eligible for marriage, and so reduces marriage rates in the inner city and increases the number of children raised in single-parent families.

At the same time the migration of middle class blacks out of the inner city leaves the poor inner city residents behind and weakens important socializing institutions such as churches, political machines, and community organizations, which in the past were supported by middle class residents and which exposed poverty area residents—particularly children and teenagers—to mainstream alternatives. Middle class outmigration also means that poverty area residents have few examples of mainstream success, and this limits their expectations about what is possible for them. This is similar to Kane's (1987) expectancy arguments. As Ellwood (1987) notes, ghetto residents "are surrounded by failure and come to expect the same." Middle class outmigration also reduces connections to job-finding networks for mainstream jobs for those left behind. Thus, "ghetto residents lose sight of and lose the capacity to pursue mainstream options," at the same time that job opportunities in the inner city are disappearing (Ellwood 1987).

While Wilson explicitly identifies three environmental conditions—high rates of male unemployment in local labor markets, highly concentrated poverty neighborhoods, and low proportions of middle class residents—he strongly emphasizes that joblessness is the most important of these structural conditions. In fact, the outmigration of middle class blacks is not essential to Wilson's argument (Jencks 1993). All that needs to happen is that the proportion of middle class black residents must drop in inner cities.

Wilson's underclass model applies primarily to the minority poor because the white poor are very unlikely to reside in highly poor neighborhoods; the model implies that class (for instance, family and neighborhood poverty and "social isolation") will be more important than race as a source of intergenerational inequality. Wilson's (1993) more recent work does emphasize the continuing importance of racial discrimination, residential segregation, and the effect of racial discrimination on ghetto residents.

Wilson, more than any other author, led empirical researchers to focus on the intergenerational transmission of poverty. First, he brings the issue of neighborhoods and neighborhood effects back into the debate. Second, he emphasizes the importance of economic demand conditions, especially changes in demand for low-skilled workers and the slow growth of wages since the early 1970s. Third, his model allows structure and culture to interact—i.e. he contends that labor market and demographic changes have "socially isolated" the inner-city black poor and affected the structure and organization of family and community life. When writing about culture, Wilson (1987: 138) states clearly his belief that if opportunities change then the culture will eventually respond: His "concept of 'social isolation' does *not* imply self-perpetuating cultural traits."[5] Wilson is less explicit about how long it will take the culture to respond.

Wilson's model requires both economic and social service strategies to reverse the factors that generated an urban underclass. If macroeconomic policies can provide jobs and social services policies can combat the effects of social isolation, then reductions in negative attitudes and behaviors will result. Wilson's model also implies that time limits on welfare recipiency will be counterproductive unless job opportunities for ghetto residents are provided.

Both Wilson's social isolation model and Mead's welfare culture model are "contagion" and "epidemic" models (Crane 1991, Jencks & Mayer 1990). Both models imply that for some reason (either the lack of good jobs or increases in residents' welfare use) community residents become isolated from mainstream society and trapped in poverty and dependency. Such epidemic models predict that neighborhood effects will be small until the neighborhood has tipped past the critical point for an epidemic.

EMPIRICAL RESEARCH ON THE INTERGENERATIONAL TRANSMISSION OF POVERTY

The four models above identify many factors that may affect the intergenerational transmission of poverty and welfare dependency: parental poverty, parental disadvantages such as female headship (which are correlated with parental poverty and which have independent effects on children's poverty and welfare use), parental welfare use, perverse welfare incentives, underclass neighborhood characteristics, and lack of labor market opportunities. Starting in the 1980s, researchers began to exploit newly available longitudinal datasets to investigate whether and how much these factors constrain individuals' intergenerational mobility. A major challenge for these studies has been to disentangle the unique effects of each of these factors.

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[5] This view is like Harrington's and Lewis' view in that culture is seen initially as a response to structural problems, but Wilson, unlike these two, posits that culture will change if structure changes.

Parental Poverty

Intergenerational poverty looks much like intragenerational poverty. Using PSID data from 1968 to 1988, Tables 1 and 2 examine the intergenerational consequences of growing up poor. There is considerable mobility—less than one in four black poor children and one in ten white poor children remain poor in early adulthood, but children raised in poverty acquire less schooling, achieve much lower incomes, and are much more likely to be poor in early adulthood than are children raised in non-poor families. Black children raised in poor families are 2.5 times more likely to be poor in early adulthood than are black children raised in non-poor families, and white children raised in poor families are 7.5 times more likely to be poor as adults than are white children raised in non-poor families (Table 1). Further, children raised in persistently poor homes (poor more than 50% of time observed in childhood) are likely to cycle in and out of poverty as adults. Indeed among young adults raised in persistently poor homes as children, 46.3% of blacks and 24.2% of whites report their adult incomes were below the poverty line in at least one year during early adulthood (see Table 2).

Table 1 Adult outcomes by childhood poverty[a]

Early Adult Outcomes[b]	Childhood poverty status			
	Black		White	
	Poor	Non-poor	Poor	Non-poor
Mean schooling[b]	12.3	12.9	11.1	13.5
Average family income[b] (1980 $'s)	$16,980	$22,778	$22,141	$33,655
Average ratio of income to needs[b]	2.1	3.0	2.6	4.4
Percent who are poor as adults[b,c]	24.9	9.6	9.3	1.2

[a] Sample = Adults Aged 27 years to 35 years in 1988 from the PSID. These adults were aged 7 – 15 years in 1968. Thus, they were observed at 3 – 13 years as a child before age 17 years and 3 – 11 years as an adult after age 24 years (969 blacks and 1306 whites).

[b] All means are weighted

[c] A respondent is defined poor if the ratio of her/his family income to needs, averaged over the years observed as a child (adult) is less than 1.0. Here needs is an Orshansky-type poverty line. Note this is a very stringent definition since the PSID tends to pick up more reported income than does the Census, and food stamps are included in family income.

Table 2 Transitions between childhood and early adulthood poverty[a,b]

Childhood upbringing	Early adult outcomes		
Poverty status during childhood[c]	Percent never poor	Percent poor 1–50% of years	Percent poor 51–100% of years
Black			
Never poor	73.8	17.9	8.3
Poor 1–50% of years	63.3	17.0	19.8
Poor 51–100% of years	53.7	19.9	26.4
White			
Never poor	89.8	9.0	1.2
Poor 1–50% of years	77.9	18.6	3.7
Poor 51–100% of years	75.9	14.3	9.8

[a] Sample = Adults aged 27 years to 35 years in 1988 from the PSID. These adults were aged 7–15 years in 1968. Thus, they were observed 3–13 years as a child before age 17 years and 3–11 years as an adult after age 24 years.

[b] All percentages are weighted

[c] Percent years poor = 100 × (# of years poor as a child) / (# years observed as a child)

Even in a multivariate context, parental income status influences virtually all of children's adult attainment outcomes—although the sizes of effects vary with the outcome examined. Low parental income is associated with fewer years of schooling, lower chances of graduating from high school, and lower college attendance, even in studies that control for family structure, parents' schooling, parents' work hours, parental welfare use, and neighborhood characteristics (Hill & Duncan 1987, Haveman et al 1991, Brooks-Gunn et al 1993, Corcoran et al 1987, Haveman & Wolfe 1994, Duncan 1994). These estimated schooling effects, while usually significant, are modest to moderate in size, once one controls for parental education. For example, Duncan (1994) reports that an increase of one in the ratio of family income to needs leads to about one fifth to one third of a year of additional schooling. There are no consistent and significant patterns of race or sex differences in the effects of parental income on children's schooling across studies. Most of the studies of schooling outcomes do not explicitly consider effects of very low incomes (i.e. poverty).

Growing up poor or in low-income families is associated with large reductions in men's labor supply, hourly wages, annual earnings, family incomes, and family income/needs (Corcoran et al 1987, 1992, Solon 1992, Hill & Duncan 1987, Hill et al 1985, Corcoran & Adams 1993, 1994, Haveman & Wolfe 1994). Corcoran & Adams (1994) report that men who grow up in poor families work 170–330 fewer hours per year than do men raised in middle income families, even after controlling for family structure, parental work hours, parents' and neighbors' welfare use, level of state welfare benefits, labor market unemployment rates, and men's schooling. Corcoran & Adams (1993) report that growing up in a poor family reduces men's hourly wages by more than 30% and men's annual earnings by more than 40%, even with extensive family, neighborhood, and labor market controls.

Five features of the recent intergenerational poverty/income literature deserve special comment. First, estimated effects of parental income on children's attainments are larger in size and more significant when multiple-year rather than single-year income measures are used.[6] Second, effects of parental income on the adult economic outcomes of children do not differ by race (Corcoran & Adams 1993, 1994). This is consistent with Hauser & Featherman's (1977) finding that the status attainment process was becoming similar for whites and nonwhites, and with Wilson's (1987) argument that class now "matters" for blacks. Third, adding controls for family advantages, childhood neighborhood advantages, adult labor market conditions, and sons' years of schooling only slightly reduce effects of parental poverty on children's economic outcomes (see Corcoran et al 1992, Corcoran & Adams 1993, 1994). Fourth, estimates of effects of parental welfare receipt on children's outcomes may be artificially inflated in studies that fail to control for nonlinear income effects:[7] Adding such a control, Corcoran et al (1992) find that the effect of parental welfare income on sons' labor income drops by one fourth to one third. Fifth, effects of parental poverty on children's adult economic outcomes are at least as large and usually much larger than are effects of parental schooling, family structure, parental welfare use, parental work, and childhood neighborhood disadvantages (Corcoran et al 1992, Corcoran & Adams 1993, 1994).

Children's futures are clearly constrained by a lack of economic resources. Growing up poor moderately reduces children's schooling[8] and substantially reduces men's adult economic status. Poor children, both black and white, are adversely affected.

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[6] Solon (1992) regresses son's income status on father's income status, varying the length over which father's income is measured from one to five years. In his paper, coefficients on paternal income increase the more years used up to about three years and then level off and stabilize.

[7] Another way to control for nonlinear income effects is to log the parental income measure. Solon (1992) measured the father-son income correlation by regressing the natural log of the son's income on the natural log of the father's income. This means that a percentage increase in paternal income has the same percentage effect on son's income at every level of paternal income. Thus a $1000 increase when father's income is $10,000 has the same effect on son's income as does a $100,000 increase when father's income is $1,000,000. Since this review focuses on poverty transmission, I am more interested in nonlinear income specifications that allow one to directly estimate effects of parental poverty.

[8] Most studies on the effects of parental income on children's schooling use linear income status measures and do not directly estimate effects of parental poverty. If this were done, we might estimate that parental poverty had stronger impacts on schooling than those implied by the linear measures.

Exactly why growing up poor hurts children's economic status is a puzzle. We can rule out certain possibilities. A primary theme in Becker's (1981) economic model of the family and in poverty policy debates is that children who grow up poor remain poor as adults because poor parents invest less in their children's schooling. It is certainly true that poor children acquire less schooling than do non-poor children and that schooling is associated with higher adult incomes. But, both past and recent studies that control for schooling demonstrate that most of the effect of parental poverty on children's economic outcomes is independent of schooling. Similarly, the research provides little support for the argument that parental and neighborhood disadvantages correlated with parental poverty are the major factors reducing children's economic outcomes, because the effects of parental poverty remain large, even with controls for family structure, family size, maternal schooling, parental work, and neighborhood disadvantages. Poverty is clearly not just a proxy for the measured parental and neighborhood disadvantages examined in these studies.

This still leaves the puzzle of how childhood poverty inhibits men's wages, earnings, and incomes. One possibility is that long-term poverty influences men's human capital in ways not fully captured by measures of completed schooling. Perhaps, children from poor families have poorer health, more stress, lower cognitive skills, or go to lower quality schools, compared to non-poor children with the same level of schooling. Miller & Korenman (1993) find that children raised in poor homes are more likely to be "stunted" (low height-for-age), to be "wasted" (low weight-for-height), and to score lower on indicators of cognitive development. Effects are larger for long-run versus short-run poverty and persist even with controls for sex, age, race and ethnicity of child, family structure, birth order, mother's education, and mother's cognitive test scores. Brooks-Gunn et al (1994) report that in a panel of about 500 low-birth-weight children, parental income in the children's first three years of life strongly predicts children's cognitive test scores at age five years, even after controlling family structure, mother's schooling, mother's age, and mother's verbal ability.

If these physical and cognitive deficits persist into adulthood and if they reduce adult earnings, then perhaps some of the effects of long-run parental poverty on men's earnings are mediated by developmental delays. A number of recent and past studies report that men's cognitive test scores have a strong, positive association with men's earnings (Sewell & Hauser 1975, Jencks et al 1979, O'Neill 1990, Bishop 1991). Murnane et al (1993) and Ferguson (1993) find that effects of test scores on wages have grown over time.

The previous two paragraphs outline a model where parental poverty lowers children's adult economic outcomes because parental poverty (perhaps because of increased stress or inability to provide enriched environments, access to good schools, or adequate nutrition) lowers children's cognitive skills, and these lower cognitive skills lead to lower adult earnings for children. Herrnstein & Murray agree that poor children have lower cognitive skills than do non-poor children and that lower cognitive skills lead to lower adult economic outcomes for children, but they propose a different model. They argue that children in poor families tend to have lower test scores in large part because poor children have inherited their parents' cognitive deficits.

Unfortunately, Herrnstein & Murray's (1994) analysis of poverty, summarized in chapter five of *The Bell Curve,* does not allow us to differentiate between the two competing models. Herrnstein & Murray estimate a child's adult poverty status as a function of that child's score on the Armed Forces Qualification Test (AFQT) and of a parental SES index. They find that both AFQT score and parental SES significantly predict a child's adult poverty status and that the AFQT score is the stronger predictor. But, because the child's AFQT score is measured after age 14 years, the coefficient on AFQT picks up both the effects of inherited IQ ("being born smart") and any indirect effects of parental SES on a child's adult poverty status that operate via test scores. The results cited above from the studies by Miller & Korenman (1993) and Brooks-Gunn et al (1994) suggest that these indirect effects could be quite large.

In addition, Herrnstein & Murray's (1994) analysis of poverty transmission likely understates the size of the direct effects of parental economic status on children's attainments independent of test scores. Herrnstein's & Murray's parental SES index lumps together parental income, parental schooling, and parental occupational status. Childhood poverty is a much more powerful predictor of children's adult incomes than are parental schooling and parental occupational status. Combining the different dimensions of parental status into a single measure will produce a weaker relationship between parental SES and adult poverty than would be the case using only an income-based measure. Furthermore, Herrnstein & Murray (1994) report that for many individuals in their sample, the authors measure parental income only over one year or not at all. Solon (1992) has shown that father-son income correlations increase sharply when multiple-year rather than single-year paternal income measures are used.

Family Structure Effects

The early status attainment literature typically tested for family structure effects by including a measure of whether the respondent lived with only one parent at age 16 years (Winship 1992). More recent research on family structure effects has exploited longitudinal datasets such as the PSID, the NLSY, and the High School and Beyond (HSB) survey to specify and test more dynamic models of family structure effects on children's schooling, out-of-wedlock births, and idleness among young men (Astone & McLanahan 1991, Bumpass & McLanahan 1989, McLanahan 1988, 1994, McLanahan & Bumpass 1988, Boggess 1994, Sandefur et al 1992, Haveman & Wolfe 1994). This literature is extensive, sophisticated, and consistent. McLanahan & Sandefur (1994) superbly synthesize much of this research and extend it with new analyses. I rely on their analyses in the discussion below.

According to McLanahan & Sandefur (1994), being raised in a non-intact family doubles the risk that a child will drop out of high school, doubles the risk that a child will have a teenage birth, and raises, by about 40%, children's risks of being neither employed nor in school in their young adult years. These risks vary somewhat by ethnicity, race and sex, by cause of disruption and age at disruption, but the risks are more similar than different across the various subgroups (McLanahan & Sandefur 1994).[9]

McLanahan & Sandefur next show that children in non-intact families have fewer resources than do children in intact families—lower incomes, fewer parental non-economic resources (measured by time spent with fathers, time spent with mothers, parental help with school work, parental supervision and parental aspirations) and fewer community resources (measured by census tract characteristics, school characteristics, and residential mobility) than do children in married-couple families. McLanahan & Sandefur's results indicate that these resource differences account for much, but not all, of the risks of high-school drop out rates, teenage premarital births and idleness.[10] Controlling for parental income alone reduces negative effects of family structure on the risk of dropping out of high school by one half, the risk of a teenage birth by slightly more than one half, and the risk of being idle by about 45%.[11] Controlling for parental non-economic resources (involvement, supervision, and aspirations) alone reduces these risks by 50%, 20%, and 100%, respectively.[12] Controlling for both parental income and residential mobility (a proxy for change in community resources) lowers these risks by about 100%, 77%, and 72% respectively; these reductions are smaller (60%, 55%, and 40% respectively) when McLanahan & Sandefur control for resources before a divorce or break-up.[13] Dataset limitations prevent estimates of how much simultaneously controlling all three sets of resources lowers these risks.

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[9] These risk estimates also vary across surveys. The ones presented here are my rough averages.

[10] They do this using several national longitudinal datasets (PSID, NSLY, High School and Beyond (HSB). Whenever possible, they control for resources before a divorce or break-up.

[11] These reductions are based on analyses using the PSID.

[12] These reductions are based on analyses using the HSB.

[13] These reductions are based on analyses using the PSID (McLanahan & Sanefur:130).

Adults raised as children in non-intact families show diminished adult outcomes primarily because as children, they had less access to parental economic resources, parental non-economic resources, and community resources. This is consistent with the resources argument. But being raised in non-intact families significantly affects high school graduation and teenage fertility even after resources are controlled, suggesting support for sociological or psychological theories related to distress, socialization effects, role models, etc.

Parental Welfare Recipiency

The key prediction of the welfare culture model is that welfare use will be passed on from mothers to daughters and that sons raised on welfare will work less as adults, because welfare "traps" recipients and their children by perversely affecting their attitudes, values, and behaviors. Opponents of this view claim that the alleged "welfare trap" is really a "poverty trap" (Zimmerman & Levine 1993): Both generations behave in similar ways because both face the same lack of resources and opportunities. This argument recalls Liebow's critique of the culture of poverty.

Most researchers find that daughters raised in welfare homes are more likely to have teen out-of-wedlock births and to go on welfare than are girls raised in nonwelfare homes. These effects of parental welfare use drop by as much as half, but often remain significant after adjusting for family background and neighborhood disadvantages and for whether or not the mothers were eligible for welfare (An et al 1993, Santiago 1994, Hill et al 1985, Hill & Ponza 1983, 1989, Solon et al 1988, Gottschalk 1990, 1992, Zimmerman & Levine 1993). Parental welfare use also has moderate effects on schooling (Hill et al 1985, Haveman et al 1991, Brooks-Gunn et al 1993, Haveman & Wolfe 1994, Duncan 1994, Duncan & Yeung 1994). The magnitude of the effects of parental welfare use vary occasionally (but usually not consistently and significantly across studies) by race and sex.

Results of studies of the effects of parental welfare use on sons' labor supply and earnings or wages are inconsistent. Consider these analyses of the effects of parental welfare use on sons' labor supply. Hill & Ponza (1983) and Haveman & Wolfe (1994) report small negative, insignificant effects of parental welfare; Corcoran et al (1992) report a moderate, negative, and significant effect; Hill & O'Neill (1993) report negative, significant effects for whites and Hispanics, but not for blacks; Corcoran & Adams (1993, 1994) report no effect for whites and a large, negative, significant effect for blacks (and only with heavy and not light or moderate welfare use); Lerman (1986) reports a significant negative effect for blacks, but this effect disappears when the predicted parental welfare measure is instrumented. A similar inconsistency characterizes analyses of the effects of parental welfare receipt on sons' hourly wages (Corcoran et al 1992, Hill & Duncan 1987, Corcoran & Adams 1994).

One result suggests that low parental resources and structural labor market problems are a part of the reason heavy parental welfare use is associated with low work hours for black sons: When Corcoran & Adams (1993, 1994) add measures of parental poverty and measures of labor market opportunities facing parents and facing adult sons to regressions of black sons' work hours and annual labor income on parental welfare use, the estimated effects of parental welfare use on black sons' work hours and labor income drop by one half.

The research on intergenerational welfare effects has been criticized on a number of grounds. First, because of data limitations, most analyses measure parental welfare receipt only or mostly during a child's adolescence, rather than during all of childhood. Several studies find that welfare received by parents during a child's adolescence has a much stronger effect on that child's schooling and teenage fertility than does welfare received during a child's early years (Furstenberg et al 1990, Gottschalk 1994, An et al 1993, 1994). Thus, effects of parental welfare may be overestimated in most of the studies reviewed here.

Second, Moffitt (1992), Antel (1992), Hill & O'Neill (1992), and Zimmerman & Levine (1993) claim that most analyses of intergenerational welfare effects fail to deal with potential endogeneity of the parental welfare variables. For example, we know that parental poverty negatively affects children's outcomes and that families must be quite poor in order to receive welfare. Therefore, we should first model the intergenerational transmission of poverty, then model the intergenerational effects of welfare, independent of parental poverty. When this is not done, omitted variables that influence the transmission of poverty will be included in the error term of the intergenerational welfare equation and will be correlated with parental welfare effects. This will likely artificially inflate estimates of parental welfare effects.

Researchers deal with potential endogeneity in several ways. Lerman (1986), Antel (1992), Hill & O'Neill (1992), and Zimmerman & Levine[14] (1993) use instrumented variables techniques, identifying the parental welfare equation through the welfare benefits in the state of residence and local labor market conditions facing the mother; Gottschalk (1994) and Duncan & Yeung (1994) include mother's welfare use after the daughter left home to control for unobservables. Gottschalk (1994) also directly models the correlations in unobservables between the mother's and daughter's equations and identifies this model using information about the discrepancy between mother's predicted and actual

[14] Zimmerman & Levine also instrument family income.

welfare use. Results are not consistent across these studies:[15] The effects of parental welfare disappear or drop sharply in some studies (Lerman 1986, Hill & O'Neill 1992, Zimmerman & Levine 1993), but remain sizable in other studies (Antel 1992, Gottschalk, 1994, Duncan & Yeung 1994).

A third problem is that most of the studies cited here do not test for nonlinear effects of welfare use. The literature on intragenerational welfare use suggests that short-run and long-run welfare users are quite different groups, and that the "welfare culture" model is really a story about welfare dependency, not a story about short-run welfare receipt.

Finally, two key assumptions of the welfare culture model are that being on welfare alters recipients' and their children's attitudes and values, and that these "bad" attitudes and values foster subsequent behaviors that lead to welfare use and inhibit economic mobility. Directly testing these assumptions requires examining how individuals' attitudes change when they go on welfare and then showing that changes in attitudes reduce mobility for both parents and children. Hill et al (1985) test these assumptions using the PSID and report little support for these assumptions. However, only a few psychological measures are available in the PSID; going on welfare could alter attitudes and values not measured in the PSID.

State Welfare Benefits

Models that say that the welfare system itself creates intergenerational dependency argue that it is the perverse economic incentives of welfare programs that lead girls to bear illegitimate children and boys to become idle adults. Several analysts have investigated this by estimating children's outcomes as a function of measures of state welfare benefits, after controlling for family background.[16] Plotnick (1990) examines five aspects of state welfare policy: the AFDC-Food Stamps guarantee, an index of the stringency of AFDC eligibility requirements, whether there is an AFDC-UP program, the availability of AFDC benefits to pregnant women without children, and an index of the requirements of AFDC recipients. Lundberg & Plotnick (1993) examine state

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[15] The inconsistency may be caused by imprecise instrumented variables. If parental welfare is poorly predicted by its instruments, then instrumented parental welfare will be measured with considerable error Another problem with choosing instruments is that most potential instrumenting variables should also be included in the child's equation (Moffitt 1992). Usually local unemployment rates and the state welfare benefits facing the parents are the variables used to identify the parental welfare equation. But these variables are likely correlated with the local unemployment rates and state welfare benefits facing the child as an adult, both of which belong in the child's equation.

[16] There is a large literature on whether welfare incentives increase illegitimacy. (See Moffitt 1992 for an elegant review of this literature.) Moffitt claims that the evidence is mixed on whether the welfare system fosters illegitimacy.

AFDC-FS guarantees, abortion policies, and family planning programs. Both studies find that many of the policy variables are significantly associated with out-of-wedlock childbearing for white teenage girls, but Plotnick (1990) finds no associations for Hispanic teenagers. Lundberg & Plotnick (1993) report no association, and Plotnick (1990) reports weak and unstable associations between policy measures and black teenage girls' out-of-wedlock births. Results from other studies are mixed—estimated associations between state welfare benefits and teenage out-of-wedlock births and/or AFDC use are usually in the right direction, but typically they are weak and insignificant (Duncan & Hoffman 1990, An et al 1993, Haveman & Wolfe 1994, Hill & O'Neill 1993, Zimmerman & Levine 1993). Results on whether state welfare benefits affect sons' labor supply are similarly mixed (Corcoran & Adams 1994, Hill & O'Neill 1993). Taken as a whole, the evidence on perverse welfare disincentives is mixed and inconclusive.

Neighborhood Effects

An exciting new area of intergenerational research is the literature on neighborhood effects, motivated primarily by Wilson (1987). The resources, welfare culture, and Wilson's models all imply that neighborhoods play an important role in perpetuating poverty and dependency across generations. Furthermore, most people believe that neighborhoods are important and often go to great lengths to find housing in the right neighborhood. Journalists and ethnographers paint terrifying pictures of the dangers and stresses facing children who live in highly poor, urban ghettoes (Kotlowicz 1991, Anderson 1990).

Evaluations of Chicago's Gautreaux experiment, which relocated black public housing residents into subsidized city and suburban private apartments, strongly support the notion that neighborhoods matter. Rosenbaum (1991) compares outcomes of children relocated in city apartments to those of children relocated in suburban apartments. He finds that children in the suburbs were much less likely to drop out of high school, were considerably more likely to attend college, were more likely to be employed and had higher earnings.

Beginning with Datcher (1982), a number of authors have estimated effects of childhood neighborhoods on children's schooling, fertility, employment and earnings (Jencks & Mayer 1990, Crane 1991, Dornbusch et al 1991, Case & Katz 1991, Clark 1992, Corcoran et al 1992, Evans et al 1992, Brooks-Gunn et al 1993, Hill & O'Neill 1993, Plotnick & Hoffman 1993, Haveman & Wolfe 1994, Duncan 1994, Corcoran & Adams 1993, 1994). A number of thorny theoretical and technical problems plague these studies. Tienda (1989) and Ellwood (1992) note that both theory and practice gloss over the issues of defining the boundaries of an individual's "community" and of specifying the processes by which neighborhoods influence children's outcomes. In most neighborhood research on survey data, the appropriate neighborhood is defined by available data—usually the zip code or census tract—and aggregate measures of neighborhood residents' characteristics (i.e. unemployment rates, poverty rates, etc) serve as imperfect proxies for complex neighborhood processes such as school resources, community norms, social isolation, social control, peer group pressure, etc. Both problems should downwardly bias estimates of neighborhood effects.

On the other hand, Gramlich (1993) and Manski (1991) point out that selection bias and the "reflection problem" should lead to overestimates of neighborhood effects. Selection bias occurs when neighborhood characteristics are proxies for unmeasured parental characteristics that affect children's outcomes and that lead parents to move into particular kinds of neighborhoods. Selection bias can be reduced but not eliminated by employing careful and extensive family background controls. Evans et al (1992) argue that simply controlling for family background will not be enough, and that, in addition, the endogeneity of neighborhood factors must be modelled directly.

The reflection problem occurs when the child's behavioral outcome is part of the measure of the neighborhood characteristic. For instance, suppose we estimated whether a teenager completed high school as a function of the high school dropout rate in his census tract. We would estimate a significant coefficient on the census tract high school dropout rate even if there were no causal impact of the neighborhood dropout rate on teenagers' school choices. The reflection problem is less of an issue when there is a long time-lag between the periods when childhood neighborhood characteristics are measured and the child's adult outcomes are measured.

Virtually all of the new studies of the effects of neighborhoods find that some neighborhood characteristics have significant associations with a particular child's outcome. Usually the magnitude of childhood neighborhood "effects," while significant, is smaller than are the effects of family characteristics. Often the size and significance of neighborhood characteristics vary by race. Unfortunately, which neighborhood characteristics "matter" varies greatly across studies, even when studies use the same dataset and look at the same outcome.

There is little evidence of contagion or epidemic effects of neighborhoods on minority children's outcomes, as would be predicted by the welfare culture and social isolation models. Only Crane (1991) reports evidence that neighborhood effects are nonlinear for minority youth, but Clark (1992) was unable to replicate Crane's results using more recent data.

What explains this variability in results? The studies themselves offer a clue. Many analysts report that when they examine effects of only one neighborhood characteristic at a time, any single "bad" neighborhood characteristic (i.e. poverty rate, unemployment rate, proportion on welfare, proportion of families headed by a woman) is significantly associated with diminished attainment (Crane 1991, Clark 1992, Brooks-Gunn et al 1993, Corcoran & Adams 1993, Hill & O'Neill 1993, Haveman & Wolfe 1994, Duncan 1994). But when analysts estimate effects of several "bad" neighborhood characteristics, coefficient estimates are unstable because of multicollinearity problems. The final choice of neighborhood variables may sometimes be driven more by data considerations than by theory. Indeed, Crane (1991) states he examined 16 neighborhood characteristics and chose "percentage of workers with professional or managerial jobs" because it had the strongest association with his outcomes.

If these suspicions are correct, then the most one can conclude from current studies is that growing up in "bad" neighborhoods is bad for children, but we don't know what it is about bad neighborhoods that matters. It could be neighborhood poverty, neighborhood welfare use, an inadequate tax base, poor public services, neighborhood family structure, absence of middle class role models, or a host of other possibilities.

Labor Market Conditions

The literature on how local labor market conditions affect the intergenerational transfer of poverty and dependency is profoundly unsatisfactory. Basically, there are two connected sets of crucial questions about the role of labor markets—one dealing with trends in the economy and one dealing with the relative importance of structural labor market conditions versus culture versus perverse welfare incentives as sources of socioeconomic mobility. Neither of these sets of questions has been completely answered.

Economic growth has been very slow for the past two decades, and economic inequalities widened in the 1980s (Danziger & Gottschalk 1995). Duncan et al (1993) show that intragenerational movement out of low-income status and into middle-income status declined in the 1980s. What are the consequences of these macroeconomic trends for the intergenerational transmission of poverty and dependency? We have located no research on this question. Certainly we would expect less upward mobility overall, but whether this rigidifies or reduces intergenerational inequality is not clear.

A key theme in past and current debates about the causes of poverty is the importance of labor markets versus culture and state welfare benefits as causes of intergenerational dependency and mobility. Perhaps parents' status is correlated with children's adult status because children raised in areas with limited job opportunities tend to remain in these areas as adults, and labor market conditions tend to be correlated across time. How much of the apparent effects of parental welfare use and neighborhoods on children's adult outcome are really due to poor labor market opportunities? How well do labor market opportunities predict adult outcomes compared to family, neighborhood, and state welfare benefits? A research literature is gradually emerging here, but it is still at a primitive stage.

A number of analysts have included measures of local unemployment rates along with a wide range of family-level measures when estimating effects of parental welfare receipt on daughters' teenage out-of-wedlock births and/or AFDC receipt and on sons' labor supply and earnings. Coefficients on the local unemployment rate measures are in the expected directions, but estimated effects are usually small relative to the effects of family characteristics, especially family income measures (An et al 1993, Hill & Duncan 1987, Zimmerman & Levine 1993, Hill & O'Neill 1993, Antel 1992, Corcoran & Adams 1993, 1994, Santiago 1994, Haveman & Wolfe 1994).

Two studies, however, suggest that adult labor market opportunities may be very important. Duncan & Hoffman (1990) predict black teenage girls' expected family incomes at age 27 years as a function of their parental family's characteristics and of their siblings' actual attainments at age 27 years, and estimate whether or not black girls have AFDC-related, out-of-wedlock, teen births as a function of their expected income at age 27 years, state AFDC benefit levels, and family background measures. Expected family income at age 27 years has a significant negative effect on out-of-wedlock, AFDC-related, teen births; that is, girls with lower income expectations at age 27 are more likely to become unmarried mothers and to receive AFDC as teenagers. This effect is much larger than the estimated effect of state welfare benefits and is slightly smaller than the effect of family welfare receipt. Corcoran & Adams (1993, 1994) evaluate the relative importance of labor market opportunities as causes of black men's work hours and earnings by adding measures of the male unemployment rate in men's local labor markets to regressions of black men's earnings and work hours on family characteristics, neighborhood measures, and parental welfare. When they do this, the coefficients on the parental welfare use and on the neighborhood measures drop considerably, and the estimated effects of the unemployment rate on black men's annual earnings and work hours are as large or larger than are estimated effects of parental welfare use; these effects are much larger than are the effects of either state welfare benefits or neighborhood characteristics.

The findings that economic expectations and labor market conditions matter for black teen age girls' fertility and AFDC receipt and for black young men's labor supply and earnings are consistent with Wilson's arguments (1987, 1993) that structural labor market conditions constrain the abilities of minority youth to avoid joblessness, poverty, and dependency. Unfortunately, this evidence is only suggestive. The following unanswered questions remain: How much do labor markets matter? How much do they matter relative to parental resources, culture, and state welfare benefits? How many of what seem to be intergenerational welfare effects are really effects of correlated lack of opportunities?

Race

Because the new longitudinal datasets have large national minority subsamples, there is more research in the 1980s than there was in the 1970s on the role of race in the intergenerational transmission of poverty and dependency. One discouraging finding of this research is that, when viewed from a longitudinal perspective, black children have even fewer background advantages relative to white children than the cross-sectional data numbers might indicate. Almost 80% of black children will live in a poor home for at least one year during childhood, and 25% of black children will be poor during most of their childhood years (Ashworth et al 1992). The comparable figures for white children are 21% and 3%. Race-based differences in childhood welfare receipt are similar (Duncan & Yeung 1994). Black children are more than three times more likely than white children to live in a household that receives AFDC income at some point during their childhood (66% versus 19%), and black children are five times more likely than white children to live in a family that receives welfare for ten or more years (20% versus 4%). Moreover, these race-based gaps between black and white parental poverty and parental welfare receipt are not narrowing over time (Duncan & Rogers 1991, Duncan & Yeung 1994).

Because blacks have far more background disadvantages than do whites, and because background disadvantages, especially parental poverty and welfare use, "matter" for economic success, black sons have much lower wages, earnings and incomes than do white sons. Controlling for background substantially reduces but does not eliminate these race-based differences in men's wages, earnings, and incomes (Hill et al 1985, Corcoran et al 1992). This residual could be due to discrimination. Kirschenman & Neckerman (1991) report that inner-city employers say they are reluctant to hire minority men. Turner et al (1991) report that in employer audit studies when matched pairs of black and white job-seekers applied for the same jobs, whites were more likely to be interviewed and offered jobs.

Interestingly, controlling for background does eliminate white children's schooling advantage. And in some studies, once background disadvantages are controlled, blacks actually acquire more schooling than do whites (Corcoran et al 1987, Mayer 1991, Haveman et al 1991). This is inconsistent with arguments that black children are less motivated to stay in school than are white children for "cultural" reasons.

Race "matters" in two ways. Black children are badly off relative to white children; this reduces their chances of avoiding poverty and welfare use as adults. But, even when children come from similar backgrounds, black children will do less well economically as adults than will white children, and there is suggestive evidence from employer surveys and audit studies that race-based discrimination still exists.

CONCLUSIONS AND SUGGESTIONS FOR FUTURE RESEARCH

These studies strongly support the economic resources model: Parental economic resources consistently predict children's adult attainments. They predict all outcomes and have large impacts on men's labor supply, wages and earnings. Furthermore, parental income effects on labor market outcomes are nonlinear: Being poor matters a lot.

By what route parental income matters is less clear. We do know that measured background disadvantages correlated with parental income cannot account for these income effects.[17] Parental poverty has large effects on men's earnings, wages, and work hours—even after controlling for a long list of parental disadvantages, neighborhood disadvantages, labor market conditions, and state welfare benefits. This is not to say that background advantages other than income are unimportant. Family structure independently affects children's risks of dropping out of high school and girls' risks of a premarital birth—even when parental income, parental noneconomic resources, and neighborhood resources are controlled. Parental schooling is positively associated with children's schooling, even when parental income and family structure are controlled.

Putting aside the correlated disadvantages argument returns us to the central issue: What is it about childhood poverty itself that damages children's economic prospects? Becker's model of the family plausibly predicts that parents' resources affect children's mobility because parents use these resources to develop children's human capital—particularly schooling: no money, no investment. However, little support emerges in the research cited above: Parental income effects on children's adult wages, work hours, and earnings were reduced by less than one fourth when children's schooling was controlled.

The evidence for (or against) the welfare culture model is weak. Consistent with the model, parental welfare receipt has moderate effects on children's schooling, and on teenage girls' out-of-wedlock births and/or AFDC receipt. Whether these are cultural effects or are artifacts of an intergenerational transmission of poverty is still unresolved. It is not clear whether being raised in welfare neighborhoods reduces children's attainments, since neighborhood measures tend to be highly correlated. Studies differ on whether being raised on welfare encourages idleness in young men, and there is no consistent evidence that state welfare benefits affect young women's teenage out-of-wedlock births, or young men's labor supply. Nor is it clear that being on welfare changes parents' and children's values and attitudes in ways that inhibit economic mobility.

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[17] Note, we can never totally reject the correlated disadvantages argument. Current research has certainly not exhausted the list of potential background disadvantages that are associated with parental poverty.

Evidence for Wilson's underclass arguments is strong but is still at a preliminary stage. Consistent with Wilson's theory, evidence indicates that labor markets and neighborhoods matter for black children's economic mobility. Young black men's labor market outcomes are strongly tied to the male unemployment rates in these men's childhood and adult labor markets. Analyses of the Gautreaux Program show that moving children from inner-city Chicago to the suburbs dramatically improved their expected schooling and work outcomes. Studies using survey data find that the characteristics of children's neighbors are associated with children's adult outcomes, but the studies cannot isolate exactly what it is about neighborhoods that makes a difference, and so they do not directly test Wilson's model.

A major finding in the research cited here is that being born into a black family rather than into a white family dramatically reduces a child's adult economic prospects. The vast majority of black children will be poor, will live in a family that receives welfare, and will live in a single parent home at some point during their childhood. Large minorities of black children will be in these situations for a long time during childhood. The race differences in parental poverty and parental welfare use are large, are not dropping over time, and lead to significantly lower adult economic attainments. Employer surveys and audit studies suggest that black men, in addition to getting off to a slower start, may still face discrimination once they enter the labor market.

The strongest priority for future research on the intergenerational transmission of poverty should now be to show how and why parental poverty itself diminishes children's adult economic attainments. There are many avenues to explore. For instance, chronic lack of parental money may have direct long-term health consequences for children that affect them as adults. Miller & Korenman (1993) demonstrate that parental poverty is related to delays in children's physical development. Physically underdeveloped and ill children might become less healthy and hence less employable adults, a process perhaps arising from inadequacies of the physical environment that poverty affords or from inadequate treatment of children's ailments directly due to lack of economic resources or indirectly due to parental inattention or resignation: better to ignore the things you cannot alter.

The delays in physical development may also affect cognitive development. Additionally, the economic stresses of poverty might leave parents unable to afford economically to create a physical environment that adequately stimulates children's cognitive development. Persistent poverty is associated with lower scores on indicators of cognitive skills (Miller & Korenman 1993, Brooks-Gunn et al 1994), and it is well documented that higher cognitive test scores are associated with increased earnings, even when schooling is controlled for.

For the children of the long-term poor, stress might be another avenue. Money can buy a cushion against stress, even if only an occasional escapist night out, or more broadly, the opportunity to indulge one's own tastes. Stress as experienced by children may have a nonlinear relation to economic resources; below a certain level of economic resources (perhaps below the poverty line) children may experience considerably more stress and become adults who cannot manage stress. Such adults may be less likely to hold the jobs they obtain or to obtain the jobs they seek. Hill & Sandfort (1994) review several psychological studies that find that low parental income is associated with increased parental stress, that parents with high levels of stress respond less to children's needs, and that children in poor and stressed families have higher levels of depression and of behavioral and emotional problems. Because these studies use small and unrepresentative samples with limited controls for parental characteristics and do not investigate the relationship between childhood stress and children's adult incomes, it is difficult to generalize.[18]

Finally, children in long-term poverty may simply fail to obtain the connections or noncognitive skills needed to succeed in the labor market. Poor parents may be unable to pass on the kinds of job-networking or risk-taking or confidence building strategies that are basic to their children's adult functioning. Children may also learn behaviors from parents that will later reinforce employer prejudices against hiring them—ways of dressing or talking or attitudes to authority figures (i.e. the boss) or ways of relating to small groups.

There are two big gaps in research on the welfare culture model: the dissension over whether the estimated welfare effects from the literature are "real" or are due to the transmission of poverty, and the lack of research tracing the role of attitudes and values in the intergenerational transmission of welfare. Filling in these gaps raises formidable technical and data problems. As Zimmerman & Levine (1993) point out, neither parental income nor parental welfare are truly exogenous. It is difficult to think of variables to identify the parental income and parental welfare equations that strongly predict parental welfare or parental income and that either do not belong in the child's equation or are not highly correlated with variables that do belong in the child's equation. Exploring the role of values in intergenerational welfare dependency requires longitudinal data on mothers and children with values measured both before and after the first spells of welfare receipt. Such data may become available as the NLSY follows the children born to the original respondents.

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[18] Haveman & Wolfe (1994) report that childhood stress factors (number of location moves, years living with a disabled parent) are associated with less schooling.

There is also a gap between the theories of neighborhood effects and the data and methods used to explore those theories. Wilson's social isolation model is complex and interactive (Ellwood 1992), yet the studies that analyze neighborhoods typically use the average characteristics of a census tract's (or zip code's) residents as a proxy for complex neighborhood processes. Such studies are limited in what they can achieve. Unfortunately it is easier to diagnose the problem than to solve it. Two approaches now being tried are ethnographic work in the tradition of Anderson (1990) and social experiments such as the new Movement to Opportunity programs that are modeled on the Gautreaux Program.

Perhaps the biggest gap is the lack of research on how growing up poor affects daughters' adult economic outcomes. Most of the research reviewed here only estimates how family and neighborhood background influence girls' schooling, fertility, and welfare use; there has been hardly any exploration of background effects on girls' wages, earnings, family incomes, and chances of being poor as adults. This omission is serious. Duncan & Hoffman (1990) find that girls' expected adult economic attainments strongly influence their fertility decisions as teenagers. There is a clear need for theory and research on the ways in which background and neighborhood disadvantages, especially parental poverty, constrain girls' economic mobility.

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Literature Cited

Altonji JG, Dunn TA. 1991. Relationships among the family incomes and labor market outcomes of relatives. *Res. Labor Econ.* 12:269–310

An CB, Haveman R, Wolfe B. 1993 Teen out-of-wedlock births and welfare receipt, the role of childhood events and economic circumstances. *R. Econ. Statist.* 75·195–208

An CB, Haveman R, Wolfe B. 1994. *The "Window Problem" in studies of children's attainments: a methodological exploration.* Univ. Wisc. Unpublished ms.

Anderson E. 1990 *Streetwise: Race, Class, and Change in an Urban Community.* Chicago: Univ. Chicago Press

Antel J. 1992. The inter-generational transfer of welfare dependency: some statistical evidence. *R. Econ. Statist.* 74:467–73

Ashworth K, Hill MS, Walker R. 1992. *Economic disadvantage during childhood.* Inst. Soc. Res., Univ. Mich. Unpublished ms.

Astone NM, McLanahan SS. 1991. Family structure and high school completion: the role of parental practices. *Am. Sociol. Rev.* 56:309–20

Auletta K. 1982. *The Underclass.* New York: Random House

Bane MJ, Ellwood DT. 1986. Slipping into and out of poverty: the dynamics of spells. *J. Hum. Resour.* 21:1–23

Bane MJ, Ellwood DT. 1994. *Welfare Realities: From Rhetoric to Reform.* Cambridge. Harvard Univ. Press

Becker GS. 1981. *A Treatise on the Family.* Cambridge: Harvard Univ. Press

Becker GS. 1993. *Human Capital.* Chicago: Univ. Chicago Press

Behrman J, Taubman P, Wales T. 1985. Intergenerational earnings mobility in the US: some estimates and a test of Becker's intergenerational endowments model. *R. Econ. Statist.* 67:144–51

Bishop J. 1991. Achievement test scores, and relative wages. In *Workers and Their Wages,* ed. MH Kosters. Washington, DC: AEI

Blau PM, Duncan OD 1967. *The American Occupational Structure.* New York: Free

Boggess S. 1994. *Family structure, economic status and educational attainment.* Dep. Econ., Univ. Mich. Unpublished ms.

Brooks-Gunn J, Duncan GJ, Klebanov PK, Sealand N. 1993. Do neighborhoods influence child and adolescent development? *Am. J. Sociol.* 99:353–95

Brooks-Gunn J, Klebanov PK, Duncan GJ. 1994. *Ethnic differences in children's intelligence test scores: role of economic deprivation, home environment, and maternal characteristics.* Teachers Coll., Columbia Univ., New York. Unpublished ms.

Bumpass L, McLanahan SS. 1989. Unmarried motherhood: recent trends, composition, and black-white differences. *Demography* 26: 279–86

Case AC, Katz LF. 1991. *The company you keep: the effects of family and neighborhood on disadvantaged youths. Work. Pap. No 3705.* Natl. Bur. Econ. Res. Washingon, DC

Clark R. 1992. *Neighborhood effects on dropping out of school among teenage boys.* Urban Inst. Unpublished ms.

Coleman JS. 1990. *Foundations of Social Theory.* Cambridge: Belknap

Corcoran M. 1992. Background, earnings and the American dream. *Contemp. Sociol.* 21: 603–9

Corcoran M, Adams T. 1993. *Race, poverty, welfare and neighborhood influences on men's economic outcomes.* Univ. Mich. Unpublished ms.

Corcoran M, Adams T. 1994. *Family and neighborhood welfare dependency and son's labor supply.* Univ. Mich. Unpublished ms.

Corcoran M, Duncan GJ, Gurin G, Gurin P. 1985. Myth and reality: the causes and persistence of poverty. *J. Policy Analysis Manage.* 4:516–36

Corcoran M, Gordon R, Laren D, Solon G. 1987. *Intergenerational transmission of education, income, and earnings.* Univ. Mich. Unpublished ms.

Corcoran M, Gordon R, Laren D, Solon G. 1992. The association between men's economic status and their family and community origins. *J. Hum. Resour.* 27:575–601

Crane J. 1991. The epidemic theory of ghettos and neighborhood effects on dropping out and teenage childbearing. *Am. J. Sociol.* 96: 1226–59

Danziger SD, Gottschalk P. 1995. *Economic Hardships: Slow Growth and Increasing Inequalities.* New York: Sage. In press

Datcher LP. 1982. Effects of community and family background on achievement. *R. Econ. Statist.* 64:32–41

Dornbusch SM, Ritter LP, Steinberg L. 1991. Community influences on the relation of family statuses to adolescent school performance: differences between African Americans and non-Hispanic whites. *Am. J. Educ.* 38:543–67

Duncan GJ. 1994. *Families and neighborhoods as sources of disadvantage in the schooling decisions of white and black adolescents.* Univ Mich. Unpublished ms.

Duncan GJ, Hoffman S. 1990. Teenage welfare receipt and subsequent dependence among black adolescent mothers. *Fam. Planning Perspect.* 22:16–35

Duncan GJ, Rogers W. 1991. Has children's poverty become more persistent? *Am. Sociol. Rev.* 56:538–50

Duncan GJ, Smeeding TM, Rogers W. 1993. W(h)ither the middle class? A dynamic view. In *Poverty and Prosperity in the USA in the Late Twentieth Century,* ed. DB Papadimitriou, EN Wolff, pp. 240–71. New York: MacMillan

Duncan GJ, Yeung W 1994. *Extent and consequences of welfare dependence among America's children.* Inst. Soc. Res., Univ. Mich. Unpublished ms.

Duncan OD. 1968. Inheritance of poverty or inheritance of race? In *On Understanding Poverty,* ed. DP Moynihan. New York: Basic

Duncan OD, Featherman DL, Duncan B. 1972. *Socioeconomic Background and Achievement.* New York: Seminar

Ellwood D. 1987. *Understanding Dependency:*

Choices, Confidence, or Culture? Washington, DC: US Dep. Health & Hum. Serv./ASPE

Ellwood D. 1992. *Mr. Wilson's neighborhoods: review of neighborhood effects papers.* Harvard Univ. Unpublished ms.

Evans W, Oates WB, Schwab RM. 1992. Measuring peer group effects: a study of teenage behavior. *J. Polit. Econ.* 100:966–91

Featherman DL, Hauser RM. 1978. *Opportunity and Change.* New York: Academic

Ferguson RF. 1993. *New evidence on the growing value of skill and consequences for racial disparity and returns to schooling.* Harvard Univ. Unpublished ms.

Furstenberg F, Levine J, Brooks-Gunn J. 1990. The children of teenage mothers: patterns of childbearing in two generations. *Fam. Plann. Perspect.* 22:54–61

Gottschalk P. 1990. AFDC participation across generations. *Am. Econ. Rev.* 80:367–71

Gottschalk P. 1992. The intergenerational transmission of welfare participation: facts and possible causes. *J. Policy Analysis Manage.* 11:254–72

Gottschalk P. 1994. *Is the correlation in welfare participation across generations spurious?* Boston Coll. Unpublished ms.

Gottschalk P, Moffitt RA. 1994. Welfare dependence: concepts, measures, and trends. *Am. Econ. Rev.* 84:38–42

Gramlich E. 1993. *Poor people or poor places?* Univ. Mich. Unpublished ms.

Hauser RM, Featherman DL. 1977. *The Process of Stratification: Trends and Analyses.* New York: Academic

Hauser RM, Sewell WH. 1986. Family effects in simple models of education, occupational status, and earnings: findings from the Wisconsin and Kalamazoo studies. *J. Labor Econ.* 4:S83–115

Haveman R, Wolfe B. 1994. *Succeeding Generations.* New York: Sage

Haveman R, Wolfe B, Spalding J. 1991. Childhood events and circumstances influencing high school completion. *Demography* 28: 133–57

Herrnstein R, Murray C. 1994. *The Bell Curve: Intelligence and Class Structure in American Life.* New York: Free

Hill MA, O'Neill J. 1992. *The transmission of cognitive achievement across three generations.* Ctr. Study Bus. & Govt., Baruch Coll. Unpublished ms.

Hill MA, O'Neill J. 1993. *Underclass behaviors in the United States: measurement and analysis of determinants.* Ctr. Study Bus. & Govt., Baruch Coll. Unpublihsed ms.

Hill MS, Augustyniak S, Duncan GJ, Gurin G, Gurin P, et al. 1985. *Motivation and Economic Mobility.* Ann Arbor, MI: Inst. Soc. Res., Univ. Mich.

Hill MS, Duncan GJ. 1987. Parental family income and the socioeconomic attainments of children. *Soc. Sci. Res.* 16:39–73

Hill MS, Ponza M. 1983. *Intergenerational transmission of dependence: does welfare dependency beget dependency?* Pap. presented Southern Econ. Assoc. Meet.

Hill MS, Ponza M. 1989. *Intergenerational transmission of welfare dependency.* Inst. Soc. Res., Univ. Mich. Unpublished ms.

Hill MS, Sandfort JR. 1994. *Effects of childhood poverty on productivity later in life: implications for public policy.* Univ. Mich. Unpublished ms.

Jencks C. 1993. *Rethinking Social Policy.* Cambridge: Harvard Univ. Press

Jencks C, Bartlett S, Corcoran M, Gouse J, Eaglesfield D, et al. 1979. *Who Gets Ahead: The Determinants of Economic Success in America.* New York: Basic

Jencks C, Mayer SE. 1990. The social consequences of growing up in a poor neighborhood. In *Inner-City Poverty in the United States,* ed. LL McGeary. Washington, DC: Natl. Acad.

Jencks C, Peterson PE, eds. 1991. *The Urban Underclass.* Washington, DC: Brookings Inst.

Jencks C, Smith M, Acland H, Bane MJ, Cohen D, et al. 1972. *Inequality: A Reassessment of the Effect of Family and Schooling in America.* New York: Basic

Kane TJ. 1987. Giving back control: long-term poverty and motivation. *Soc. Ser. Rev.* 61: 405–19

Kirschenman J, Neckerman KM. 1991. "We'd love to hire them, but...": the meaning of race for employers. In *The Urban Underclass,* ed. C Jencks, PE Peterson, pp. 203–34. Washington, DC: Brookings Inst.

Kotlowicz A. 1991. *There are No Children Here: The Story of Two Boys Growing Up in the Other America.* New York: Doubleday

Lerman R. 1986. Do welfare programs affect the schooling and work patterns of young black men? In *The Black Youth Employment Problem,* ed. R Freeman, H Holzer. Chicago: Univ. Chicago Press

Lewis O. 1968. *La Vida: A Puerto Rican Family in the Culture of Poverty: San Juan and New York.* London: Panther

Loury G. 1981. Intergenerational transfers and the distribution of earnings. *Econometrica* 49:843–67

Lundberg S, Plotnick RD. 1993. *Adolescent premarital childbearing: Do economic incentives matter?* Univ. Wash. Unpublished ms.

Manski C. 1991. *Identification of endogenous social effects: the reflection problem.* Unpublished ms. Univ. Wisconsin

Massey DS. 1990. American apartheid and the making of an American underclass. *Am. J. Sociol.* 96:329–57

Mayer SE. 1991. How much does a high school's racial and socioeconomic mix affect graduation and teenage fertility rates? In *The Urban Underclass*, ed. C Jencks, PE Peterson, pp. 321–41. Washington, DC: Brookings Inst.

McLanahan SS. 1988. Family structure and dependency: early transition to female household headship. *Demography* 25:1–16

McLanahan SS. 1994. The consequences of single motherhood. *Am. Prospect* 18:48–58

McLanahan SS, Bumpass L. 1988. Intergenerational consequences of family disruption. *Am. J. Sociol.* 94:130–52

McLanahan SS, Sandefur GD. 1994. *Uncertain Childhood, Uncertain Future*. Cambridge: Harvard Univ. Press

Mead LM. 1986. *Beyond Entitlement: The Social Obligations of Citizenship*. New York: Free

Mead LM. 1992. *The New Politics of Poverty: The Non Working Poor in America*. New York: Basic

Miller J, Korenman S. 1993. *Long-term poverty, physical growth, cognitive skills and child development*. Univ. Minn. Unpublished ms.

Mincy R. 1994. *Nurturing Young Black Males*. Washington, DC: Urban Inst.

Moffitt R. 1992. Incentive effects of the US welfare system, a review. *J. Econ. Lit.* 30:1–61

Moynihan DP. 1965. *The Negro Family*. Washington, DC: US Dep. Labor

Murnane RJ, Willet JB, Levy F 1993. *The growing importance of cognitive skills in wage determination*. Grad. Sch. Educ., Harvard Univ. Unpublished ms.

Murray C. 1984. *Losing Ground: American Social Policy 1950–1980*. New York: Basic

O'Neill J. 1990. The role of human capital in earnings differences between black and white men. *J. Econ Perspect.* 4:25–45

Patterson JT. 1986. *America's Struggle Against Poverty, 1900–1985*. Cambridge: Harvard Univ. Press

Plotnick R. 1990. Welfare and out-of-wedlock childbearing: evidence from the 1980s. *J. Marriage Fam.* 53:735–46

Plotnick R, Hoffman S. 1994. *Using sister pairs to estimate how neighborhoods affect adult outcome*. Unpublished ms. Dep. Econ., Univ. Delaware

Rosenbaum JE. 1991. Black pioneers—do their moves to the suburbs increase economic opportunity for mothers and children? *Housing Policy Debate* 2:1179–213

Sandefur GD, McLanahan SS, Wojtkiewicz RA. 1992. The effects of parental marital status during adolescence on high school graduation. *Soc. Forc.* 71:103–21

Santiago AM. 1994. *The intergenerational effects of welfare dependency: evidence from the national longitudinal survey of youth*. Dep. Sociol., Ind. Univ. Unpublished ms.

Sewell WH, Hauser RM. 1975. *Education, Occupation, Earnings*. New York: Academic

Solon G. 1992. Intergenerational income mobility in the United States. *Am. Econ. Rev.* 82:393–408

Solon G, Corcoran M, Gordon R, Laren D. 1988. Sibling and intergenerational correlations in welfare program participation. *J. Hum. Resour.* 23:388–96

Solon G, Corcoran M, Gordon R, Laren D. 1991. A longitudinal analysis of sibling correlations in economic status. *J. Hum. Resour.* 26:509–34

Stevens AH. 1994. The dynamics of poverty spells: updating Bane and Ellwood. *Am. Econ. Rev.* 84:34–37

Tienda M. 1989. *Poor people and poor places: deciphering neighborhood effects on behavioral outcomes*. Presented at Am. Sociol. Assoc. Meet., Chicago

Turner M, Fix M, Struyk RJ. 1991. *Opportunities denied, opportunities diminished: discrimination in hiring*. Urban Inst. Unpublished ms.

Wilson WJ. 1987. *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. Chicago, IL: Univ. Chicago Press

Wilson WJ. 1993. *The new urban poverty and the problem of race*. The Tanner Lecture. Univ. Mich., Ann Arbor

Winship C. 1992. Race, poverty, and the American occupational structure. *Contemp. Sociol.* 21:639–42

Zimmerman DJ. 1992. Regression toward mediocrity in economic stature. *Am. Econ. Rev.* 92:409–29

Zimmerman DJ, Levine PB. 1993. *The intergenerational correlation in AFDC participation: welfare trap or poverty trap?* Dep. Econ., Wellesley Coll. Unpublished ms.

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FROM CLASS CONSCIOUSNESS TO CULTURE, ACTION, AND SOCIAL ORGANIZATION

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KEY WORDS: research methods, collective action, social stratification, working-class culture, work organization

ABSTRACT

For much of the postwar period in the United States, sociological research on class consciousness has tended to be limited to and by survey methods, with the result that class consciousness has been viewed as a static, individuated phenomenon, abstracted from social action and the context of class practices. However, in recent years a body of work has developed, often based upon the concept of class formation rather than the ideationally bound concept of class consciousness, that holds more promise. By drawing upon historical, ethnographic, and participant observation techniques, this work challenges conventional approaches and points toward promising new directions for future research. This article reviews recent examples of sociological research that has sought to ground consciousness in cultural practices, in collective action, and in forms of social organization.

The Unconscious Treatment of Class Consciousness

For over three decades following World War II, the study of class consciousness in American society was constrained by two separate but not unrelated historical developments. The first was a Cold War imperative that rendered most Marxist-inspired theoretical conceptualization ideologically suspect and therefore unlikely to attract serious sociological treatment, particularly within the terms set by Marx's own analysis (Bottomore 1976). The second was American sociology's shift from its roots in Chicago School social anthropol-

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ogy toward the "Lazarsfeldian" research edifice that had begun to shape the discipline in profound ways (Boudon 1993).

In many respects Richard Centers's classic study (1949) was emblematic of these dual processes. Initially undertaken as a challenge to the findings of an earlier *Fortune* magazine survey that had found over 80% of the sample population identifying themselves as "middle class," Centers sought to demonstrate the existence of a significant working class consciousness in the United States. Adding the response "working class" to his survey of what was considered a nationally representative sample population (1097 white men), Centers found a sizeable portion (51%) registering under that label, thus offering empirical support to his euphemistically termed "interest group theory of social classes." Though some disputed his findings and interpretations (Gross 1953, Case 1955, Gordon 1963, Wilensky 1970), Centers's study served as a model for understanding the subjective dimensions of social class.

The specific methodologies have differed across a range of systematic data collection techniques, from self-administered questionnaires, to face-to-face interviews and telephone surveys, to analyses of election data. In general, however, quantitative methods that yield large data sets, utilize precise sampling techniques, and provide opportunities for statistical manipulation of the data have been strongly favored in the study of class consciousness in the United States. Though the amount of research in the United States has not been voluminous (Kerbo 1991:346–47, Gilbert & Kahl 1993:233), a substantial body of research has developed on class identification (Gross 1953, Kahl & Davis 1955, Tucker 1966, Hodge & Treiman 1968, Schreiber & Nygreen 1970, Jackman & Jackman 1983, Davis & Robinson 1988, Simpson et al 1988), on class attitudes (Eysenck 1950, Manis & Meltzer 1954, Leggett 1968, Wright 1985, Kluegel & Smith 1986), and on class political preferences and opinions (Lipset 1960, Hamilton 1972, Szymanski 1978, Weakliem 1993). Some researchers have found indications of one or another sort of class consciousness employing such methods, others have not, and still others have found it and denied it. Such differences have tended to reveal more about the preconceptions of the researchers than they have about any collective consciousness of class in the society (Marshall 1983:288, Vanneman & Cannon 1987:48).

Whether or not Marx's conceptualization is posed as the key theoretical reference point (as it often is), from a basic sociological standpoint, survey research methodology embodies some questionable assumptions with regard to the study of class consciousness. The most basic criticisms have been advanced previously and summarized by Marshall (1983). They are:

1. Survey research acquires an individualist bias by treating the responses of isolated individuals as the primary data source. Though there is an assump-

tion that individual attitudes can be summed to equal one or another form of collective consciousness, the intersubjective nature of meaning-construction in a class (or indeed any group) consciousness cannot easily be apprehended.

2. Survey responses tend to be recorded as fixed, static entities, minimizing any denotation of process, change, maturation, or ambivalence in consciousness. Contradictory or seemingly opposed meanings, oscillations, and shifts in interpretation, which are often the consequence of intersubjective processes, are ignored.
3. The exclusive focus on ideation and attitude significantly limits what may be considered an expression of consciousness. In standard survey research, class consciousness tends to be viewed as a fact that exists (or not) in the minds of subjects.
4. Such research assumes that most of what needs to be known about attitudes, conceptions, or beliefs can be learned by eliciting verbal or written responses to questions.
5. In the social survey, attitudes and ideation are artificially decontextualized because they are abstracted from the class practices and social relations that give them meaning.

Though the implications of basing class consciousness on survey methods are considerable, they are rarely considered explicitly (Coser 1975, Vanneman & Cannon 1987). However, in one case, a pair of survey researchers decided to abandon the method when they realized the limitations that it imposed on their ability to document the ambivalences and contradictory lines of thought among workers who inhabit a world full of contradictions (Blackburn & Mann 1975). More recently, Erik Wright (1985) recognized that there is "no necessary reason to assume" that the same consciousness that would be apparent in a situation of class conflict would be evident in an interview setting. He acknowledged that class consciousness is "notoriously hard to measure" and agreed that the problems raised by critics of the survey method are significant and "potentially undermine the value of questionnaire studies of class consciousness" (1985:252–53). Yet despite his reflexivity, Wright proceeded to draw upon survey data about attitudes, offering the unconvincing explanation that "the cognitive processes of people have some stability across the artificial setting of an interview and the real life setting of class struggle, and that in spite of the possible distortions of structured interviews, social surveys can potentially measure these stable elements" (p. 253). But while they may have that potential, this cannot be known using survey methods because people are not surveyed across a range of settings (let alone in class struggles), and this represents enough of a problem that the *Penguin Dictionary of Sociology* devotes an entire entry (on "Dual Consciousness") to the difficulty of assuming any such stability between the survey situation and other social settings (Abercrombie et al 1988).

A notable exception to this rule is represented in a recent study of the beliefs of a sample of Canadian postal workers before and after a strike (as well as their actions during it) whereby the context of the strike reportedly produced an ideological shift (toward solidarism, away from conciliation) that was sustained by only a minority of workers once the collective action had subsided (Langford 1994:126–27). It is generally a worthwhile study, and one which can be instructive to the extent that it underscores the disjunction between collective action and individual belief intrinsic to most survey research.

The theoretical foundations of the concept are at least as problematic as the methodological techniques used to study it. The concept of class consciousness is generally thought to have originated in the work of Karl Marx, as one of the "pivotal" elements of his theory of class and society (Gilbert & Kahl 1993:228). But I would suggest that while Marx wrote about the human consciousness that "distinguishes the worst architect from the best of bees" (quoted in Bottomore & Rubel 1961:102), and while he maintained a formulation about class relations in which a working class structured "in itself" (*an sich*) would increasingly become a class "for itself" (*für sich*) (quoted in Tucker 1978:218), to my knowledge Marx never employed the term "class consciousness," and certainly never to designate the ideational standing of a collection of individual workers, as much of the sociological (including some Marxist) research has sought to do. Even the Hungarian Marxist Georg Lukacs, who is probably most responsible for circulating the term, through his book *History and Class Consciousness*, expressly rejected reducing class consciousness to the individual, ideational level: "This analysis establishes right from the start the distance that separates class consciousness from the empirically given, and from the psychologically describable and explicable ideas which men form about their situation in life," and "...class consciousness is concerned neither with the thoughts of individuals, however advanced, nor with the state of scientific knowledge" (Lukacs, quoted in Bottomore 1973:97–100).

This is mentioned not to quibble or to engage in an arcane exercise in "marxology," but to suggest that at least a share of the sociological weaponry (particularly in the United States) used against Marx himself has been based on a partial but significant misconception, particularly as it refers to something that can be understood with reference to the ideas or beliefs of individual class members at a single moment in time. Even those with friendly intent who have sought to refine the concept to bolster Marx's perspective have helped sustain ideation as the crucial ingredient. Thus, Michael Mann's (1973) otherwise commendable attempt to specify varying levels of consciousness—identifying oneself as a class member; perceiving opposition with other classes; understanding class as defining the totality of one's society; and having a vision of an alternative, classless society—may have expanded the range of categories, but it did little to shift the emphasis away from subjectivity.

Marx himself once attempted a survey research project (Weiss 1973), and though the negligible rate of return on his survey of 101 questions would have made it a distinct failure in social scientific terms, its deviation from modern survey research on class consciousness is instructive. For his "enquête ouvriere" was not designed to elicit worker attitudes, ideas, self-identification, political preferences, or "class consciousness" but to collect concrete data on the material conditions of workers' lives: wages, methods of payment, hours, safety conditions, etc. Though obviously such a survey would have necessarily produced subjective accounts about objective conditions, Marx's interest was primarily didactic. He distributed the survey to French workers' groups, socialist circles, "and to anyone else who asked for it" (Bottomore & Rubel 1961:210) in order to prompt group discussions about working conditions, as a way to inspire class action.

To mainstream social science, such an enterprise would appear hopelessly tainted by the subjectivity of the investigator, but the relationship between theory and method was not at all incongruent for the philosopher who hoped to change the world rather than to merely interpret it. Most of what Marx needed to learn about the militancy and organizational capacities of the French working class he had learned less than a decade before his survey, largely on the basis of its mobilization and organization during the Paris Commune, as well as from the massacre of 60,000 that followed it (Tucker 1978).

Though the consciousness of class members could undoubtedly be fruitfully studied outside of a Marxist theoretical framework (Goldethorpe & Marshall 1992), in much of the survey research on class consciousness in the United States there has been a preoccupation with specifically working-class consciousness, as well as an engagement, however oblique, with Marx's supposed conception of it. The question has generally been framed by Marx's well-known dichotomy, whereby the increasing socialization of production brings a class into being "as against capital, but not yet for itself. In the struggle...this mass becomes united, and constitutes itself as a class for itself" (Marx quoted in Tucker 1978:218). But all too often, the expression "for itself" has been removed from its active, dynamic context, in which the working class is "in struggle," "becomes united," and "constitutes itself" in active, historical processes of struggling, uniting, and constituting. Though Marx never provided a formal definition of class, let alone class consciousness, his writings reveal an overwhelming theoretical regard for the actions, political mobilizations, organizational capabilities, and the functional cohesion (or lack of it) of classes in their relations and interaction with other classes.

Ideas mattered for Marx, but not in isolation from the world of action. In his formulation "objectivity" and "subjectivity" were conjoined through "conscious human activity," but conventional sociological methods have tended to abstract ideational and attitudinal responses from the realm of lived, practical experience. Important attitudinal trends may be captured in this way, but by trimming Marx's conception to fit a survey design, one is likely to bypass what may be the most important and interesting dimensions of class relations and experience. This is as true for those seeking to continue Marx's project as it is for those intent on burying it.

While random sampling and the standardization that survey schedules afford would seem to offer methodological advantages over less systematic methodological strategies, Hodson and his colleagues have demonstrated that a large number of ethnographic accounts can be systematically coded to provide a comparative database for testing hypotheses across a range of settings (Hodson et al 1993). But I would suggest that if we are interested in the extent to which classes act in relation to other classes, as the notion of a class acting "for itself" implies, then random sampling may actually obstruct one's view rather than illuminate it. The danger is that the search for a state of representativeness may overlook the most consequential cases, the principal players, the key institutions, and the rules, principles, and strategies that make them key. As Bourdieu has noted, random sampling can "mutilate the very object you have set out to construct," which is particularly relevant when studying contending groups and organizations where there may very well be "positions in a field that admit only one occupant but command the whole structure" (Bourdieu & Wacquant 1992:243).

This problem is illustrated in a recent analysis that draws upon much of the literature on class consciousness that I am critizing, to reject the very existence of class in the United States (Kingston 1994). It is a carefully presented analysis that seeks to assess the empirical support for several class theories, including Wright's (1985) map of the class structure and Giddens's (1973) conception of "structuration." Basing his assessment on a review of the quantitative literature of "recent, well conducted studies" (p. 16), Kingston finds very little evidence that "...people with a common economic position—a 'class'—share distinct life experiences" (p. 6).

Though there is much worth considering in the article, after 30 pages of an unswerving offensive against the existence of class in the United States, the reader suddenly discovers the existence of not one, but two classes: "the very rich (an upper class?)" and "the poor (a lower class?)" (p. 33). In a section entitled "Neglected Extremes," we are told that the upper class has been neglected because it is so small and can afford to defend its privacy so that it doesn't appear in representative samples of the general population, while the lower class is neglected because the relevant research is based on occupational categories that tend to exclude the poor, by definition (p. 34). But a good deal is actually known about the upper class in America, including its historical development as a group, its political mobilization, its social networks and group solidarity, its cultural practices, its socialization, its economic locations, its institutional life, and its relations with other social classes. So a class that, according to many historical and ethnographic accounts, has been viewed as more or less dominating the major economic, political, and cultural institutions of the society, and that many would consider central in understanding class relations in the United States, is "neglected" because it is "extreme" (too rich? too powerful? too exclusive? too class-like?). By the same measure, a reliance on standard occupational categories means that the unemployed and marginally employed, those who would once have been considered classic "proletarians," are similarly "neglected." But it wouldn't be necessary to neglect these groups if one would accept as valid research findings other than those based on quantitative data derived from nationally representative samples of individuals. In fact, several years earlier, a pair of researchers reinterpreted many of these same kinds of survey data and voting studies to demonstrate that when those who have been excluded from traditional samples (nonvoters, African-Americans, capitalists) are examined, and when comparative, ethnographic, and historical materials are brought to bear, an entirely different picture of class consciousness materializes (Vanneman & Cannon 1987).

By dismissing ethnographic and historical data because of its "one-group focus" or lack of "representativeness," Kingston (1994:16) and others may foreclose crucial aspects of class relations and experience. When the subjects of research and the ways of treating those subjects are rendered off-limits by a methodological technique, this is a theoretical decision, because methodological strategies are not theoretically neutral. The theoretical roots that lie beneath the stratificationist conception of class stretch at least as far back as Tocqueville. His emphasis on individual striving and the obliteration of class differences between the extremes of very rich and very poor set Tocqueville's ideas about class and class conflict off as the direct converse of Marx's (Nisbet 1966:183–86).

The disparities between approaches to class consciousness reflect fundamental differences in the conceptual status of class. The Marxist conception of class encompasses a historical relationship, not a position in a hierarchy, and is therefore best understood and studied as contingent, as a process, and as an interactional phenomenon (Thompson 1968:939, Zeitlin 1980:3, McNall et al 1991:4). Classes are social configurations structured from without (in terms of the changing "bases and forms of interclass systems of material and symbolic relations") and from within ("intraclass relations" or what is often called "class formation"), but classes are also always *partial* social configurations to the extent that they are constantly in a process of organization, disorganization, and reorganization in relation to their conflicts with other classes (Wacquant 1991:51).

Class formation has often been framed as a dual historical process comprising an objective side (in the mechanisms by which people are distributed into different economic practices) and a subjective side (ideational class consciousness). It thus tends to replicate, albeit within a historically dynamic process, a separation between objectivity and subjectivity that corresponds to the stratificationist approaches discussed earlier (Therborn 1983:39, Katznelson 1986, McNall et al 1991:7). But the view of class structure as "interclass relations" and class formation as "intraclass relations" may offer a more useful formulation (Wacquant 1991). The notion of "intraclass relations" suggests a relaxation of the subjective/objective dichotomy, thus making conceptual space for the return of "conscious human activity" in its mediating role between subjectivity and objectivity, both of which it embodies and produces.

A focus on class formation as intraclass relations would seem to provide an improved conceptual tool for studying the extent to which a class or class fraction acts "for itself." It better allows for the consideration of those practices—cultural practices, collective actions, processes of organizational construction (and destruction)—that have been central to the sustenance (and weakening) of class cohesion and definition, yet that have been largely ignored in the study of class consciousness. This does not preclude the consideration of ideation but requires that it be contextualized within real (and contingent) historical processes that emerge from the interaction between groups, or classes, in their relations with one another. In other words, ideas and attitudes must be examined in the practical, institutional, and historical contexts in which they are formed, negotiated intersubjectively, and given meaning. Such an emphasis recommends that we relinquish the concept of class consciousness as the main focus of inquiry in exchange for what would seem to be an enhanced ability to comprehend class relations.

Of course, such a project has been under way for some time, and a significant literature exists, one that could be characterized as being, simultaneously, theoretically homogeneous and thematically heterogeneous. That is, a somewhat limited range of questions has been asked of a fairly wide range of empirical materials. Various "neo-Marxist" frameworks have predominated (which is not surprising for the study of class relations and class formation), but a Weberian influence is often present as well. In what follows I review some recent and promising examples.

Culture In Action

In his classic study, *The Making of the English Working Class*, EP Thompson provided a significant critique of both stratification research and Marxist determinism, by conceptualizing and demonstrating class as an active and relational historical process and class consciousness as the cultural expression of the class experience (1968:9–12). Thompson demonstrated analytically the self-activity of the working class in its construction of an independent working-class culture as well as the relative autonomy of cultural processes from material forms. His analysis made working-class culture and consciousness significant intellectual concerns for a generation of social historians. Thompson himself thus became the intellectual forebear of the interdisciplinary scholarship that has become known as "cultural studies" (Kaye 1984, Alexander & Seidman 1990, Aronowitz 1993).

While the leitmotif of his work was "culture," including the study of various symbolic modes of expression (ritual practices, the evolution of customs, and the appropriation and alteration of traditional patterns by emergent social groups), Thompson was never fully at ease with the traditional anthropological conception of culture, which "...with its cosy invocation of consensus, may serve to distract attention from social and cultural contradictions, from the fractures and oppositions within the whole" (Thompson 1991:6). Instead, he viewed cultural expression as socially fragmented along rough class lines, "rough" both because modern class relations were emergent in the eighteenth and nineteenth centuries, and because historical contingencies, sectoral and regional differences, and the relational character of the class experience made searching for a "pure specimen" futile, no matter how finely meshed one's "sociological net" (Thompson 1968:9). Thompson's working class culture was a subculture whose products were often invested with meanings in direct opposition to the dominant cultural rules.

By conceptualizing class consciousness as cultural expression, Thompson's work expanded the field of investigation to encompass a much broader set of practices, representations, and constructions than the survey instrument could ever have allowed. It inspired a large number of social historical writings on working-class consciousness and formation as it was expressed and embodied in the development of leisure activities, family rituals, neighborhoods, social clubs, mutual aid societies, trade unions, etc (Kaye & McClelland 1990).

A crucial aspect of this "history from the bottom up" was that it placed human agency at the center of its analysis (Appelbaum 1979, Thompson 1978). But in more recent scholarship the question has been posed: Just which humans were the historical agents in the world that Thompson recovered? This work has tended to challenge the notion that a distinctly "working-class" culture and consciousness was predominant, arguing for a more historically limited "artisanal" consciousness or a more socially encompassing "populism" (Calhoun 1982, Stedman Jones 1983, McNall 1988, Scott 1988, Joyce 1991, Orr & McNall 1991). For example, where Thompson argued for the historical maturation of eighteenth century artisanal radicalism into nineteenth century working-class consciousness (revealed in the collective cultural responses to class exploitation), Calhoun (1982) viewed the centrality of the community (rather than class) as the basis for an eighteenth century artisanal radicalism that was altogether different from (rather than contiguous with) the working-class reformism evident in nineteenth century Chartism. Whereas Thompson stressed the processes by which a shared culture and a way of life were constructed in response to the exploitive social relations in which people were embedded (class consciousness as the cultural expression of the "lived experience" of class), recent "post-structural" historical analyses have emphasized the power of language both to mold workers' consciousness in the direction of various forms of populism and radicalism in ways largely independent of class and to accent the linguistic and discursive (and gendered) bases of the class experience (Stedman-Jones 1983, Joyce 1991, Scott 1991).

Though the emphasis on discourse obliges a useful rethinking of class consciousness and the role of language in shaping meaning construction, there is a danger in treating language as a "determining" force in order to beat a hasty retreat from the notion of class as an exploitive relationship (Foster 1985, Meiksins-Wood 1986). It seems less than useful to reproduce the same restrictive dependence on attitudes and ideation that has been criticized in survey research, by treating language as if it were completely disconnected, rather than as "partially autonomous," from the socially structured processes by which some groups or classes maintain the capacity to shape dialogue, discourse, and meaning (Orr & McNall 1991, Steinberg 1993). In responding to his critics, Thompson has noted the tendency to view people as "captives within a linguistic prison," thus minimizing the ways in which language is used creatively across different settings, particularly among subordinate groups where postures of deference and rebellion may be forced into cohabitation (Thompson 1991:10–11).

Moving away from accounts that treat discourse as either disembodied or determining, Steinberg has placed analytical emphasis on the *struggle* over discourse and meaning within the context of specific conflicts (Steinberg 1991, 1993). In this work, which is based on historical analyses of nineteenth century British weavers and cotton spinners, Steinberg argues that a key element in contention between groups is conflict over prevailing discourses—conflicts which, at base, are struggles over meaning and embody the potential for subversion by subordinate groups. As against the post-structural criticisms advanced by Stedman Jones, Joyce, Scott, and others, Steinberg argues that because class consciousness was constructed within and framed by a dominant bourgeois culture, the analytical focus ought to be on the processes through which the working classes used, appropriated, and placed their own stamp of meaning on bourgeois discourses, rather than on the words that were employed (Steinberg 1993:12). The search for a "pure" working-class consciousness is likely to be fruitless, he advises, for it suggests a dubious homology between social life and its representation.

Instead of a focus on social actors impelled by discourses and their meanings, as post-structural accounts would suggest, this view emphasizes the dynamics of the processes by which social actors struggle through meaning and language. For Steinberg, these struggles are most perceptible during strikes and other periods of intergroup conflict when discourses of collective identity and interest tend to be articulated most clearly and are subject to the sharpest challenges (Steinberg 1993:10).

The consideration of language is also an important element in David Wellman's recent ethnographic account of the political culture of the contemporary San Francisco waterfront (Wellman 1995). He has analyzed the discourse of longshoremen, the practical working language of the docks, through both a textual examination of the union contract and the struggles over its interpretation, as well as in an analysis of the day-to-day language that workers create to make sense of and sustain a measure of control and dignity over their lives at work (Wellman 1994).

Wellman takes a different tack from the stress on strike activity that punctuates Steinberg's analysis of language and meaning construction, as well as from Kimeldorf's (1988) view that the political generation of "34 men," veterans of the San Francisco general strike, has had a substantial and enduring impact on the political culture of the West Coast longshoremen. Instead, Wellman argues that it has not been primarily strike action or left-wing leadership that sustained the radical trade unionism of the International Longshoremen's and Warehousemans' Union (ILWU). Rather, his study demonstrates that the basic practices of everyday contract unionism have served as a foundation for a militant working-class culture among union members. Wellman's work ought to prompt some rethinking of both the nature of militancy and the nature of everyday unionism.

Generally, a focus on "action" as an expression of "consciousness" and class mobilization has figured prominently in historical and ethnographic accounts. Though the term "action" could represent virtually all social activity, the two kinds of social action most relevant to the problem of class formation have tended to be (*a*) "strategic encounters" between classes, or strategic industrial conflicts or collective actions that occur outside of the normal round of everyday life; and (*b*) processes of "organizational mobilization (and demobilization)." The first would include those strategic encounters that have had a national impact on class relations, like the British miners' strike of 1984–1985, or the strike and subsequent firing of 12,000 air traffic controllers in the United States in 1981 (Beynon 1985, Shostak & Skocik 1986), and would also include sociological analyses of local and regional conflicts that illustrate the dynamics of class formation at a more micro level (Fantasia 1988, Delgado 1993, Dudley 1994).

The concept of "cultures of solidarity" was specifically employed to avoid the ideationally bound concept of "class consciousness," in an analysis that focused on the ways in which emergent cultural formations were constructed intersubjectively and in relation to opposition, during acute industrial conflicts (Fantasia 1988). Expressed in emergent values, behaviors, and organizational forms, these "cultures of solidarity" indicated that collective "consciousness" may be bound fairly tightly to the strategic encounter that has given rise to it, and thus such cultural processes can be seen as relatively independent of the previously existing ideas and beliefs of individual participants. This analysis was based on the notion that group beliefs are more fluid in situations of conflict, than during settled periods. The main unit of analysis was not the beliefs of individuals, but the collective action and mobilization of both sides within a strategic encounter.

As Delgado's study of union organizing among undocumented immigrant workers in Los Angeles shows, while workers in such strategic encounters often draw upon the resources of existing organizations, like established unions, their emergent and grass-roots democratic character, and their ability to mobilize other social assets (ethnicity, residential community, social movements, etc), suggest that "cultures of solidarity" are not reducible to institutionalized forms of unionism (Delgado 1993).

The collective actions manifested within such strategic encounters have often been closely tied to processes of organizational mobilization and demobilization; this has been particularly true in recent years as employers have openly mobilized to break unions, which in the United States have traditionally represented the clearest embodiment of working-class organization (Cornfield 1986, Goldfield 1987, Fantasia 1993). Additionally, the processes of organizational restructuring might be viewed as examples of strategic encounters capable of engendering fervent class sentiments. In her recent study of the closing of an auto plant in Kenosha, Wisconsin, Kathryn Marie Dudley found that the workers' "cultural solidarity" wasn't created anew by the social crisis of the plant closing; she found that class solidarity had been largely sustained by the conditions of work. Instead, the crisis exposed existing underlying differences in cultural interpretation resulting from differences between the ways in which the town's working-class families and middle-class professionals constructed meaning (Dudley 1994). Similarly, in her earlier study of downward mobility, Newman found strong class differences in the interpretation of job loss and economic dislocation (Newman 1988). Studies of management innovations within the workplace have sometimes been framed to suggest their relationship to class mobilization and demobilization (Cornfield 1987, Fantasia et al 1988, Grenier 1988). Moreover, recent studies of urban poverty and industrial dislocation indicate patterns of labor market cleavage, residential segregation, racial exclusion, and other forms of social closure that have important implications for intraclass relations (Wilson 1987, Kasarda 1989, Wacquant & Wilson 1984).

In studies of class formation, organizational mobilization and demobilization indicate the degree to which classes and fractions of classes have acted on the basis of their perceived interests; and historical and comparative analyses are notable here (Katznelson & Zolberg 1986). Much of this work demonstrates the complexities and contradictions inherent in intraclass relations, as in analyses of late nineteenth century fraternal orders, which sometimes embodied an uncertain or shifting social constitution (M Clawson 1989, Orr & McNall 1991). Similar complexities are suggested by the divergent political trajectories of different unions, even within the same industry, as in the comparative studies of the left-wing West Coast longshoremen's union and the racketeer-led East Coast union, or of the radical Western Federation of Miners and the reformist United Mine Workers of America (Kimeldorf 1988, Reitman 1991).

The rise of "new social movements" would seem to represent particularly fertile ground for research on the mobilization of class organizations. Such movements tend to eschew class theories, while being largely composed of middle-class activists and informed by middle-class cultural sensibilities (Klandermans & Oegema 1987, Melucci 1989). By considering participation, mobilization strategies, ideological frameworks, coalition-building, and institutional resources from the perspective of their class bases, our understanding of the middle class might be greatly increased.

As I have suggested earlier, a good deal is already known about the upper class from research that has focused on the role of cultural practices, social networks, and institutions in the mobilization of political and economic resources. Some of the more recent examples of this work continue to be extremely valuable for an understanding of class relations in the United States (Cookson & Persell 1985, Domhoff & Dye 1987, Domhoff 1990, Roy 1991, Clawson et al 1992).

Just as important as comprehending cultural practices and collective action in the process of class formation are the ways in which various forms of social organization provide the context for shared meanings and beliefs. Here too, ethnographic and historical approaches predominate and culture is often a key focus, but the main analytical object has been to locate the roots of a shared consciousness within a particular social matrix.

The Social Organization of Culture and Consciousness

In the United Kingdom the question of the relationship between class and community has been the source of a good deal of research, partly spurred by David Lockwood's seminal article on the "sources of variation in working class images of society" (Lockwood 1966). In it he argued that the class consciousness of particular social classes cannot be imputed, in any simple way, from their relations to the means of production, because of the extent of ideological variation within social classes (Lockwood 1966). He sought the sources of this variation in "the immediate social experience" of workers, by which he meant the patterns of work and community relationships that serve to structure particular forms of consciousness (Lockwood 1966).

In the United States work by Katznelson (1981) and Halle (1984) provided a good sense of direction for understanding the social organizational bases of working-class culture and consciousness. Independently, they located important differences in the shared meanings constructed in the workplace and in the residential community, a function of the historic division between work and home (for Katznelson), and of the mix of income level, home ownership, and occupational heterogeneity (for Halle).

Equally valuable was Susan Ostrander's study of the ways in which shared meanings are constructed by upper-class women in relation to the practices and expections of upper-class family and community life (Ostrander 1980, 1984). She examined the relationship between their class activities and position in the community, where they are dominant, and their subordinate role within the family, illustrating why the former tends to define their consciousness and shape their conduct more than the latter. Other studies of gendered labor markets suggest that outside of the upper class there may be a more complicated relationship between class and gender consciousness (see Milkman 1987, Acker 1989, Yarrow 1991). When working class subcultures are divided by both racial and gender divisions, the possibilities for construction of shared meaning are rendered more complicated still, as Jay MacLeod's ethnography of black and white adolescent males in a low-income housing project indicates (MacLeod 1987). His study vividly described the diverging cultural responses toward the future within a shared context of poverty and social fragmentation.

In a very different approach, Michael Burawoy's comparative workplace ethnographies have been exemplars of a social-organizational conception of consciousness, but he argues *against* the view that working-class consciousness is produced anywhere but inside the factory gates (Burawoy & Lukacs 1992:4). Like Lockwood, Burawoy views consciousness not as a simple matter of workers' relations to the means of production; unlike Lockwood, he has focused on workers' experiences within production and on the ways that political and ideological "regimes" of production have developed to mediate between the imperatives of production relations and class consciousness.

Burawoy's formulation has developed over the course of several works. The first was a participant-observation study in a Chicago machine shop, in which Burawoy showed how the games that workers played to lessen their boredom paradoxically served to "manufacture consent" with capitalist goals, while obscuring the exploitive nature of social relations in the workplace (Burawoy 1979). When worker grievances emerged, the plant's "internal state" channeled and individualized them, instead of producing a collective response or a collective consciousness. Though the analysis may have overlooked ways in which shop floor "regimes" generate conflict as well as consent, it made an important and provocative contribution to the study of class formation by problematizing the *lack* of class consciousness in factory production and by offering an argument for the independent importance of factory "regimes" (Clawson & Fantasia 1983). Burawoy's conception of "production regimes" as consciousness-structuring mechanisms was further sharpened by the use of cross-national and historical comparisons, in which he stressed the role of the state in creating the conditions for the specific forms taken by production regimes at the local level (Burawoy 1985).

The latest work, written with a Hungarian collaborator, Janos Lukacs, is based on his participant observation in Hungarian workplaces, affording an opportunity to compare the relationship between ideology and the politics of production in the East and the West (Burawoy & Lukacs 1992). Comparing work experiences in Hungarian machine shops with those in the Chicago factory, Burawoy & Lukacs demonstrated the paradoxical "efficiency" of socialist production and "inefficiency" of capitalist production, while drawing upon experience in Hungarian steel plants to make an important argument about working-class consciousness. They found that while ideology played only a secondary role in justifying the appropriation of surplus production in a capitalist society, in state socialism appropriation by the state had constantly to be justified as an expression of collective interests through various ritual mobilizations. Consequently, "Everyone is called on to 'paint socialism' as the radiant future at the same time that everyone knows that the everyday 'reality' is anything but radiant" (Burawoy & Lukacs 1992:20–21). Ironically then, the socialist system of production tended to give rise to a working-class ideological critique for which the view was much less obscured than in the capitalist system of the United States. Through his comparative approach to production regimes, Burawoy has grounded class consciousness in the organization and regulation of work, in the "lived experience in production" (Burawoy & Lukacs 1992:113).

In a theoretical analysis that links organizational and cultural factors, Stinchcombe has drawn from EP Thompson's account of working-class consciousness to highlight the *structural* factors at work within Thompson's cultural analysis, and then to suggest the possible interplay of culture and work organization within contemporary service industries (Stinchcombe 1990). He emphasizes that in the universality of labor markets (large groups of people with identical labor contracts) and the uniformity of political rights (citizenship status), along with urbanization, industrialization produced the conditions for working-class consciousness. Culture matters, for Stinchcombe, because it is through culture that the meaning of organizational structures comes to be defined and, particularly in the case of many service industries, that workers sell cultural symbols of upper-class status. From this perspective, certain groups of workers will be less class conscious than others largely because they do not work in large groups with categorical labor contracts, they have regular contact with upper-class clients, and they are attached to upper-class cultural symbols. Thus, for Stinchcombe, "while we will not expect, say, stewardesses or pilots to be as militant as mineworkers, we will expect them to be a good deal more class conscious than workers in retail jewelry" (p. 309).

Stinchcombe's is a provocative formulation of the way in which social organization generates and structures consciousness. It contains a number of possibilities for interesting research, including his ideas about the place of status symbols in the collective consciousness of service workers. In addition he suggests that service workers will veer to the left (in political terms) if their work situation gives them more contact with working-class clients, while those whose contact is with an upper-class clientele may veer to the right.

This paper has reviewed only a portion of the relevant and recent literature on class culture, action, and social organization. A wider and deeper synthesis would surely be required to address the many theoretical and empirical gaps in our understanding of class consciousness and class formation in the United States. But with stratificationism no longer enjoying a monopoly, the scope of investigation has broadened, moving us toward a conceptualization that is collective, rather than individual, that is dynamic rather than static, and that treats class ideation in its natural (and historical) habitat of cultural practices, collective action, and social organization.

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Literature Cited

Abercrombie N, Hill S, Turner BS. 1988. *The Penguin Dictionary of Sociology*. London: Penguin

Acker J. 1989. *Doing Comparable Worth: Gender, Class and Pay Equity*. Philadelphia: Temple Univ. Press

Alexander JC, Seidman S, eds. 1990. *Culture and Society: Contemporary Debates*, ed. JC Alexander, S Seidman. New York: Cambridge Univ. Press

Appelbaum R. 1979. Born-again functionalism? A reconsideration of Althusser's structuralism. *Insurgent Sociologist* 9:18–33

Aronowitz S. 1993. *Roll Over Beethoven: The Return of Cultural Strife*. Hanover: Wesleyan Univ. Press/Univ. Press New Engl.

Beynon H, ed. 1985. *Digging Deeper*. London: Verso

Blackburn RM, Mann M. 1975. Ideology in the non-skilled working class. See Bulmer 1975, pp. 131–60

Bottomore TB, ed. 1973. *Karl Marx*. Englewood Cliffs, NJ: Prentice-Hall

Bottomore TB. 1976. *Sociology As Social Criticism*. New York: Wm. Morrow

Bottomore TB, Rubel M, eds. 1961. *Karl Marx*. London: CA Watts

Boudon R. 1993. *Paul F. Lazarsfeld: On Social Research And Its Language*. Chicago: Univ. Chicago Press

Bourdieu P, Wacquant LJD. 1992. *An Invitation to Reflexive Sociology*. Chicago: Univ. Chicago Press

Bulmer M, ed. 1975. *Working-Class Images of Society*. London: Routledge & Kegan Paul

Burawoy M. 1979. *Manufacturing Consent: Changes in the Labor Process Under Mo-*

nopoly Capitalism. Chicago: Univ. Chicago Press

Burawoy M. 1985. *The Politics of Production*. New York: Verso

Burawoy M, Lukacs J. 1992. *The Radiant Past: Ideology and Reality in Hungary's Road to Capitalism*. Chicago: Univ. Chicago Press

Calhoun C. 1982. *The Question of Class Struggle*. Chicago: Univ. Chicago Press

Case HM. 1955. Marxist implications of Centers' interest group theory: a critical appraisal. *Soc. Forces* 33:254–58

Centers R. 1949. *The Psychology of Social Classes: A Study of Class Consciousness*. Princeton: Princeton Univ. Press

Clawson D, Fantasia R. 1983. Beyond Burawoy: the dialectics of conflict and consent on the shop floor. *Theory & Soc.* 12: 671–80

Clawson D, Neustadtl A, Scott D. 1992. *Money Talks: Corporate PACs and Political Influence*. New York: Basic

Clawson M. 1989. *Constructing Brotherhood: Class, Gender, and Fraternalism*. Princeton: Princeton Univ. Press

Cookson PW, Persell CH. 1985. *Preparing for Power: America's Elite Boarding Schools*. New York: Basic

Cornfield DB. 1986. Declining union membership in the post-World War II era: the United Furniture Workers of America, 1939–1982. *Am. J. Sociol.* 91:1112-53

Cornfield DB. 1987. Labor-management cooperation or managerial control: emerging patterns of labor relations in the U.S. In *Workers, Managers, and Technological Change*, ed. DB Cornfield, pp. 331–53. New York: Plenum

Coser LA. 1975. Two methods in search of a substance. *Am. Sociol. Rev.* 40:691–700

Davis N, Robinson R. 1988. Class identification of men and women in the 1970s and 1980s. *Am. Sociol. Rev.* 53:103–12

Delgado HL. 1993. *New Immigrants, Old Unions: Organizing Undocumented Workers in Los Angeles*. Philadelphia: Temple Univ. Press

Domhoff GW. 1990. *The Power Elite and the State*. New York: Aldine De Gruyter

Domhoff GW, Dye TR, eds. 1987. *Power Elites and Organizations*. Beverly Hills, CA: Sage

Dudley KM. 1994. *The End of the Line: Lost Jobs, New Lives in Postindustrial America*. Chicago: Univ. Chicago Press

Eysenck HJ. 1950. Social attitude and social class. *Br. J. Sociol* 1:56–66

Fantasia R. 1988. *Cultures of Solidarity. Consciousness, Action, and Contemporary American Workers*. Berkeley: Univ. Calif. Press

Fantasia R. 1993. The assault on American labor. In *Social Problems*, ed. C Calhoun, G Ritzer, pp. 663–79. New York: McGraw-Hill

Fantasia R, Clawson D, Graham G. 1988. A critical view of worker participation in American industry. *Work Occup.* 15:468–88

Foster J. 1985. The declassing of language. *New Left Rev.* 150:29–45

Giddens A. 1973. *The Class Structure of the Advanced Societies*. London: Hutchinson

Gilbert D, Kahl JA. 1993. *The American Class Structure*. Belmont, CA: Wadsworth. 4th ed.

Goldfield M. 1987. *The Decline of Organized Labor in the United States*. Chicago: Univ. Chicago Press

Goldthorpe JH, Marshall G. 1992. The promising future of class analysis: a response to recent critiques. *Sociology* 26:381–400

Gordon M. 1963. *Social Class in American Sociology*. New York: McGraw-Hill

Grenier G. 1988. *Inhumane Relations: Quality Circles and Anti-Unionism in American Industry*. Philadelphia: Temple Univ. Press

Gross N. 1953. Social class of identification in the urban community. *Am. Sociol. Rev.* 18: 398–404

Halle D. 1984. *America's Working Man: Work, Home and Politics among Blue-Collar Property Owners*. Chicago: Univ. Chicago Press

Hamilton R. 1972. *Class and Politics in the United States*. New York: Wiley

Hodge RW, Treiman D. 1968. Class identification in the U.S. *Am. J. Sociol.* 73:535–47

Hodson R, Creighton S, Jamison CS, Rieble, S, Welsh S. 1993. Is worker solidarity undermined by autonomy and participation? Patterns from the ethnographic literature. *Am. Sociol. Rev.* 58:398–416

Jackman MR, Jackman RW. 1983. *Class Awareness in the United States*. Berkeley: Univ Calif. Press

Joyce P. 1991. *Visions of the People: Industrial England and the Queston of Class, 1840–1914*. Cambridge: Cambridge Univ. Press

Kahl JA, Davis JA. 1955. A comparison of indexes of socio-economic status. *Am. Sociol. Rev.* 20:317–25

Kasarda JD. 1989. Urban industrial transition and the underclass. *Ann. Am. Acad. Polit. Soc. Sci.* 501:26–47

Katznelson I. 1981. *City Trenches: Urban Planning and the Patterning of Class in the United States*. New York: Pantheon

Katznelson I. 1986. Working-class formation: constructing cases and comparisons. See Katznelson & Zolberg, pp. 3–44

Katznelson I, Zolberg I, eds. 1986. *Working-Class Formation* Princeton: Princeton Univ. Press

Kaye HJ. 1984. *The British Marxist Historians*. Oxford: Polity

Kaye HJ, McClelland K, eds. 1990. *EP Thompson: Critical Perspectives*. Philadelphia: Temple Univ. Press

Kerbo HR. 1991. *Social Stratification and Inequality*. New York: McGraw-Hill. 2nd ed.

Kimeldorf H. 1988. *Reds or Rackets? The Making of Radical and Conservative Unions on the Waterfront.* Berkeley: Univ. Calif. Press

Kingston PW. 1994. Are there classes in the United States? *Res. Soc. Strat. Mobility* 13: 3–41

Klandermans B, Oegema D. 1987. Potentials, networks, motivations, and barriers: steps towards participation in social movements. *Am. Sociol. Rev.* 52:519–31

Kluegel JR, Smith ER. 1986. *Beliefs About Inequality.* New York: Aldine De Gruyter

Langford T. 1994. Strikes and class consciousness. *Labour/Le Trevail* 33:107–37

Leggett JC. 1968. *Class, Race and Labor: Working-Class Consciousness in Detroit.* New York: Oxford Univ. Press

Lipset SM. 1960. *Political Man.* New York: Doubleday

Lockwood D. 1966. Sources of variation in working-class images of society. *Sociol. Rev.* 14:249–67

Lukacs G. 1973. Class consciousness. See Bottomore 1973, pp. 92–101

MacLeod J. 1987. *Ain't No Makin' It: Leveled Aspirations in a Low-Income Neighborhood.* Boulder, CO: Westview

Manis JG, Meltzer BN. 1954. Attitudes of textile workers to class structure. *Am. J. Sociol.* 60:30–35

Mann M. 1973. *Consciousness and Action Among the Western Working Class.* London: Macmillan

Marshall G. 1983. Some remarks on the study of working-class consciousness. *Polit. Soc* 12:263–301

McNall SG. 1988. *The Road to Rebellion: Class Formation and Kansas Populism, 1865–1900.* Chicago: Univ. Chicago Press

McNall SG, Levine RF, Fantasia R, eds. 1991. *Bringing Class Back In: Contemporary and Historical Perspectives.* Boulder, CO. Westview

Meiksins-Wood E. 1986. *The Retreat from Class.* New York: Verso

Melucci A. 1989. *Nomads of the Present: Social Movements and Individual Needs in Contemporary Society.* Philadelphia: Temple Univ. Press

Milkman R. 1987. *Gender at Work: The Dynamics of Job Segregation by Sex during World War II.* Urbana: Univ. Ill. Press

Newman K. 1988. *Falling From Grace: The Experience of Downward Mobility in the American Middle Class.* New York: Free

Nisbet RA. 1966. *The Sociological Tradition.* New York: Basic Books

Orr JR, McNall SG. 1991. See McNall et al 1991, pp. 101–17

Ostrander SA. 1980. Class consciousness as conduct and meaning. the case of upper class women. *Insurgent Sociologist* 9:38–50

Ostrander SA. 1984. *Women of the Upper Class.* Philadelphia: Temple Univ. Press

Reitman S. 1991. The politics of the Western Federation of Miners and the United Mine Workers. See McNall et al 1991, pp. 203–22

Roy D. 1991. The organization of the corporate class segment of the US capitalist class at the turn of this century. See McNall et al 1991, pp. 139–63

Schreiber EM, Nygree GT. 1970. Subjective social class in America. *Soc. Forces* 45:348–56

Scott JW. 1988. *Gender and the Politics of History.* New York: Columbia Univ. Press

Scott JW. 1991. The evidence of experience. *Crit. Inquiry* 17:773–97

Shostak AB, Skocik D. 1986. *The Air Traffic Controller's Controversy: Lessons From The PATCO Strike.* New York: Human Sci.

Simpson I, Stark D, Jackson R. 1988. Class identification processes of married, working men and women. *Am. Sociol. Rev.* 53:284–93

Stedman Jones G. 1983. *Languages of Class: Studies in English Working-Class History 1832–1982.* Cambridge: Cambridge Univ. Press

Steinberg M. 1991. Talkin' class: discourse, ideology, and their roles in class conflict. See McNall et al 1991, pp. 261–84

Steinberg M. 1993. *"The labour of the country is the wealth of the country...": class identity, consciousness and the role of discourse in the making of the English working class.* Presented at Annu. Meet. Soc. Sci. Hist. Assoc., Baltimore

Stinchcombe AL. 1990. *Information and Organizations.* Berkeley: Univ. Calif. Press

Szymanski A. 1978. *The Capitalist State and the Politics of Class* Cambridge, MA: Winthrop

Therborn G. 1983. Why some classes are more successful than others. *New Left Rev.* 138:37–55

Thompson EP. 1968. *The Making of the English Working Class.* Harmondsworth, UK: Penguin

Thompson EP. 1978. *The Poverty of Theory and Other Essays.* New York: Monthly Rev.

Thompson EP. 1991. *Customs In Common: Studies in Traditional Popular Culture.* New York: New Press

Tucker CW. 1966. On working class identification. *Am. Sociol. Rev.* 31:855–65

Tucker RC, ed. 1978. *The Marx-Engels Reader.* New York: WW Norton. 2nd ed.

Vanneman R, Cannon LW. 1987. *The American Perception of Class.* Philadelphia: Temple Univ. Press

Wacquant LJD. 1991. Making class: the middle class(es) in social theory and social structure. See McNall 1991, pp. 39–64

Wacquant LJD, Wilson WJ. 1989. The cost of racial and class exclusion in the inner city. *Ann. Am. Acad. Polit. Soc. Sci.* 501:8–25

Weakliem D. 1993. Class consciousness and political change: voting and political attitudes in the British working class, 1964 to 1970. *Am. Sociol. Rev.* 58:382–97

Wellman D. 1995. *The Union Makes Us Strong: Radical Unionism on the San Francisco Waterfront.* New York: Cambridge Univ. Press

Wiess H. 1973. Karl Marx's "enquete ouvriere". In *Karl Marx*, ed. TB Bottomore, 12: 172–84

Wilensky H. 1970. Class consciousness and American workers. In *American Society, Inc.*, ed. M Zeitlin, pp. 423–37. Chicago: Markham

Wilson WJ. 1987. *The Truly Disadvantaged: The Inner City, The Underclass, and Public Policy.* Chicago: Univ. Chicago Press

Wright EO. 1985. *Classes.* London: Verso

Yarrow M. 1991. The gender-specific class consciousness of Appalachian coal miners. See McNall 1991, pp. 285–310

Zeitlin M. 1980. On classes, class conflict, and the state: an introductory note, In *Classes, Class Conflict, and the State*, ed. M. Zeitlin, pp. 1–37. Cambridge: Winthrop

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HERE AND EVERYWHERE: Sociology of Scientific Knowledge

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KEY WORDS: philosophy of science, relativism, realism, localism, natural attitude

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ABSTRACT

The sociology of scientific knowledge (SSK) is one of the profession's most marginal specialties, yet its objects of inquiry, its modes of inquiry, and certain of its findings have very substantial bearing upon the nature and scope of the sociological enterprise in general. While traditional sociology of knowledge asked how, and to what extent, "social factors" might influence the products of the mind, SSK sought to show that knowledge was constitutively social, and in so doing, it raised fundamental questions about taken-for-granted divisions between "social versus cognitive, or natural, factors." This piece traces the historical development of the sociology of scientific knowledge and its relations with sociology and cultural inquiry as a whole. It identifies dominant "localist" sensibilities in SSK and the consequent problem it now confronts of how scientific knowledge travels. Finally, it describes several strands of criticism of SSK that have emerged from among its own practitioners, noting the ways in which some criticisms can be seen as a revival of old aspirations toward privileged meta-languages.

There is no shortage of reviews and assessments of the sociology of scientific knowledge (SSK). Most have been written by critics or by participants meaning to put their special stamp on a contentious and splintered field.[1] I too am a participant: My views about what the field is, and ought to be, are strongly held; they have been canvassed elsewhere, and they will be unavoidably evident in this survey. Yet my purpose here is less to score points than to offer a critical survey

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[1] Special note should be taken of Lynch (1993:Ch 2–4), which, while it argues a vigorous case for the virtues of ethnomethodology, is a detailed critical survey of recent trends in the social studies of science.

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of how SSK developed, and continues to develop, in relation to sociology, and to make the leading concerns of the field rather more comprehensible to sociologists in general than they have been. For this specialty, such a purpose is not banal, as neither the place of SSK in the sociological culture nor its implications for the future of sociology—especially social theory—have been adequately canvassed before.[2] The "here and everywhere" of my title refers at once to the problematic place of SSK within academic sociology and to a central problem it has generated and now confronts—how to interpret the relationship between the local settings in which scientific knowledge is produced and the unique efficiency with which such knowledge seems to travel.

Sociology of Scientific Knowledge and the Academic Culture

SSK must count as one of sociology's notable recent successes. Emerging not more than 25 years ago, in the 1970s and early 1980s it was an almost exclusively British practice (Collins 1983a:266–71). Now there are influential practitioners throughout North America, as well as in France, Germany, the Netherlands, Scandinavia, Israel, and Australia; and key Anglophone works have been translated into French, Italian, Japanese, Polish, Russian, and Spanish. Programs in "Science Studies," "Science and Technology Studies," or "Science, Technology and Society"—several elaborately funded by the US National Science Foundation—employing sociologists of scientific knowledge have sprung up at leading American universities; relevant professional societies flourish. Journals and academic publishers, once unaware of or uninterested in the field, now actively seek out contributions, creating a situation in which demand outstrips quality supply. Seminal monographs have been reprinted and advertised as "classics" (Bloor 1991, Collins 1992); anthologies, primers, synthetic surveys, and candidate textbooks have appeared and been superseded by new texts bidding to redefine a fast-changing field (Barnes 1972, 1985, Mulkay 1979, Barnes & Shapin 1979, Barnes & Edge 1982, Law & Lodge 1984, Yearley 1984, Woolgar 1988a, Cozzens & Gieryn 1990, Callon & Latour 1991, Jasanoff et al 1994).

Projects have been launched to intercalate the findings of SSK into programs of science communication and liberal education (Collins & Pinch 1993, Chambers & Turnbull 1989)[3] and into the analysis and formulation of science and technology policy (Jasanoff 1990, 1992, Wynne 1992, Collins 1985, Fuller 1993, Cambrosio et al 1990, Travis & Collins 1991, Epstein 1993), while the potential of SSK (broadly construed) to recast the traditional categories of social and cultural theory as a whole has been asserted (Latour 1993, Law 1994).[4]

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[2] As I shall note below, many sociologists of scientific knowledge were not professionally trained in sociology, and neither was I. (My training and much of my work belong more to history than to sociology.) Such amateurism often betrays itself in naiveté, far less often in insight into fundamentals. Not coming to sociology through a normal career-route, I find myself "unprofessionally" interested in what it *is* to have a sociological understanding of science.

[3] A measure of the provisional success of these suggestions is a recent series on scientific experiment, published in *The Economist* (Morton & Carr 1993), which draws heavily upon SSK research.

Most importantly, the general academic culture has shown great interest in what has been done in this field. Unlike many other sociological specialties, SSK has strongly engaged the attention of historians and philosophers (e.g. Shapin 1982, Shapin & Schaffer 1985, Rudwick 1985, Golinski 1990, Dear 1995, Fuller 1988, 1992, Rouse 1987, Toulmin 1990), and the boundary lines between what counts as historical or philosophical and what as sociological practice in the area have been blurred to the point of invisibility.[5] Meanwhile anthropologists, literary and feminist theoreticians, and a loosely defined but trendy "cultural studies" community have been attracted in significant numbers to the study of science largely through work in SSK. The social study of science is one of the modern academy's most unremittingly interdisciplinary projects.

Twenty-five years ago it was a truth almost universally acknowledged that there might be a legitimate sociological understanding of scientific error, of "the blind alleys entered by science," of the state of scientific institutionalization, and, perhaps, of the overall dynamics of scientific foci, but that there could be no such thing as a sociology of authentically scientific knowledge (Ben-David 1971:11–13). Now, while assent to the validity of SSK is scarcely universal, a number of central claims have quietly passed into common academic currency, and the recent paths of the history and philosophy of science, technology, and medicine have been fundamentally shaped by practitioners' appreciation of opportunities opened up or problems posed by SSK research.

At the same time, the field shows many signs of being in serious trouble: Some problems are of very long standing, while others must be seen as the bitter fruits of success itself. The very achievement of SSK in establishing the possibility, legitimacy, and interest of a thoroughly sociological (and social historical) understanding of scientific knowledge has attracted so great a range of scholars from other disciplines that neither the boundaries of the field nor its intellectual goals and foci are any longer at all clear. What appears to some practitioners as an admirable "diversity of voices" seems to others lamentable incoherence and lack of seriousness of purpose. The "social study of science," as opposed to SSK "proper," has developed into one of the modern academy's most centrifugal, most argumentative (at times uncivil), as well as most vital terrains (e.g. Pickering 1992). Just because what is at stake is nothing less than the proper interpretation of our culture's most highly valued form of knowledge—its truth—the struggle for interpretative rights has become fraught and bitter. Names are called and mud is slung. The weight of the world's injustices is dumped firmly on the shoulders of those maintaining "incorrect" methodological views. This is not a practice for the cardiovascularly challenged.

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[4] Recent social theorists continue to comment centrally on modern science and technology while engaging only obliquely or not at all with the SSK literature (e.g. Bauman 1993:199–209, Giddens 1993:9–15, Bourdieu 1990, 1991).

[5] When the speciality was last reviewed in this journal, HM Collins (1983a:272) acutely noted that the relationship between SSK and relevant history was seamless and that a "proper description" of the field "would treat the history of science as integral." Yet, largely restricting his treatment to ethnographic studies of contemporary science, Collins did not there attempt to offer such a "proper" account. Two years earlier (Collins 1981a), he had voiced doubts that historical work was capable in principle of attaining the ethnographer's understanding of science, and four years later (1987) he proclaimed that historical studies represented some of the best SSK. Shifting judgments are possibly best read as reliable reflections of shifting realities.

Fundamental issues of methodological propriety are fervently debated. Choices between Durkheimian objectivism and Weberian subjectivism, explanatory and interpretative goals, stress on structure and agency, micro and macro foci, theoretical and empirical methods—all are often fought out in relative disengagement from the career of parallel debates in mainstream sociology, with results ranging from rediscovered wheels to important respecifications of the terms of debate (Callon & Latour 1981, Collins 1981a, 1983b, Knorr-Cetina 1981a,b, Law 1974, 1984, Turner 1981). Metaphysical and ontological schemes are proffered, and it is asserted that sociology of science requires the adoption of the correct scheme, while skeptics wonder why interpretative projects should be supposed to require a metaphysics (Latour 1993, Shapin 1992:354–60). Leading sociologists of science discover that the practice has contained social-theoretical entities, such as "interests," and announce their gleeful despair that "definitive" descriptions or explanations of science can ever be attained, while other practitioners express bemusement that anyone could ever think to construct accounts free of theorizing or pretending to definitiveness (Woolgar 1981, Barnes 1981).

Relativism is attacked (far less often than it is actually commended) as an insidious threat to the fabric of social order, while advocates argue that methodological (not moral or ontological) relativism is simply necessary for the naturalistic interpretation of variation in belief.[6] Practitioners agonize over the proper posture of the analyst, as between disinterested and committed. The original claim that SSK was just the extension of science to the study of itself (Bloor [1976] 1991) has been countered by the increasingly insistent—though perhaps not yet dominant—voices of writers meaning to "expose" science (as

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[6] For an analyst to say that the credibility of two different beliefs about the world should be interpreted using the same *methods* is, thus, not necessarily the same thing as saying that they are equally "true" or that the world(s) to which they refer is(are) multiple. Almost all SSK relativists set aside ontological questions and treat truth-judgments as topic rather than as resource. So far as morality is concerned, the dominant tendency here is not to celebrate moral anarchy but to interpret how locally varying moral standards acquire their obligatory character.

"hegemonic," as "masculinist," as "dehumanizing," as "mystifying") and by those who reckon that a proper task for scholars is to open up alternative visions of what science might be and how its social relations ought to be constituted (Martin 1993, Restivo 1989, Lynch & Fuhrman 1991, Scott et al 1990; cf Collins 1991, Lynch 1992b).

Quite recently, small numbers of eminent natural scientists have become aware of SSK, and, cavalierly neglecting crucial differences in tone and intent among practitioners, have sought to expose them all as motivated by hostility to science, purportedly animated by hidden political agendas (Gross & Levitt 1994, Wolpert 1992). Alleged crises in public confidence in, and support for, science have been traced—incredible as it may seem—to the sinister influence of SSK and fellow-traveling philosophy of science (e.g. Theocharis & Psimipoulis 1987). The political vulnerability of one of the few sociological specialties that, so to speak, "studies up," that aims to interpret a culture far more powerful and prestigious than itself, and that offers accounts at variance with that culture's official myths, is only now being made manifest. As the Chinese proverb has it, he who rides on the back of the tiger may wind up inside.

The number of sociologists working in the area continues to be very small. The rise of SSK to relative popularity coincided with the Thatcher government's systematic reduction in British university funding, from which several of the original homes of this sort of work suffered significantly, eroding or eliminating their ability to train the next generation. A surge of interest in this area among American institutions from the mid-1980s was also checked by recession and a consequent retrenchment in graduate student support and opportunity. Hard times discourage intellectual adventurousness, on the part of both students and recruitment committees. Time and improving economies may heal these wounds, but endemic structural difficulties beset SSK.

First, the sociological study of science makes demands upon initiates which all but a handful find difficult to fulfill. Despite the continuing scientistic bent of North American sociology, few students come equipped with relevant competences in the natural sciences. The genuine incapacity of many to get to grips with the scientific technicalities involved is added to the fear of others that such competences will be extremely hard to acquire. Despite much liberal educational rhetoric and distribution requirements, the gap between the "Two Cultures" described by CP Snow in 1959 has not noticeably been bridged. There is a widespread, and partly justified, sense that SSK is "hard," and students searching for a secure career-track are encouraged to look elsewhere.[7]

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[7] Yet it has to be noted that the study of *any* culture possessing esoteric knowledge—e.g. that of machinists, soldiers, nurses, or Azande magicians—demands similar dedication and similar commitment to technical mastery. It is arguably not the "difficulty" of science but its "prestige" and "sacredness" that beget this heightened anxiety.

Nor does the poor availability of undergraduate courses in the area do much either to inform students about what the specialty is like or to give them even a smattering of familiarity to set against structurally induced "technophobia." Moreover, scientistic North American sociological traditions and, to a lesser extent, traditions in Britain and Europe continue actively to disseminate a picture of scientific "method" and scientific knowledge radically at variance with those offered by SSK. There is an argument that the last great bastion of faith in simplistic images of science and its "method" is not to be found in the natural but in the social sciences.

Students thus trained often find the body of recent SSK—when they encounter it—not just unfamiliar but shocking. Few sociology texts prepare them for the claim that scientific truth is amenable to a thoroughgoing sociological scrutiny, while some of the most senior and eminent authorities remain among the unconvinced or unapproving. Joseph Ben-David (1981:41–47, 54–55), judging work in the area to be largely "programmatic," pronounced SSK to be "sociologically irrelevant" and a "failure." Stephen Cole (1992: 81), while making irenic gestures toward SSK, nevertheless gave his opinion that it had "failed to generate a single example or case study" that shows that social processes "actually influence the specific cognitive content of science." And TS Kuhn (1992:8–9), dissociating himself from sociological appropriation of his work, has recently proclaimed that SSK, or, more ambiguously, what "has been widely understood" as its claims, is "an example of deconstruction gone mad."[8] Compared to other specialties, SSK has few senior advocates or practitioners in the sociological profession, nor, despite its persistent characterization as "fashionable," is association with SSK evidently a sound strategy of career advancement.

SSK and Sociology

The founding father of the sociology of science, Robert K Merton, worked from the late 1930s through the 1960s to constitute the study of science as a legitimate branch of structural-functionalist sociology, while at the same time he attempted to constitute sociology as "scientific." What counted as "being scientific" was overwhelmingly taken from formal and informal philosophical models of the natural scientific "method" (e.g. Parsons 1949:Ch 1). The same sensibility that persuaded Merton and his associates that sociological accounting had to stop at the door of scientific method and scientific knowledge (e.g. Merton 1970:xviii–xix, 75, 199–200) also supported the claims of sociology to be a genuine science. Accordingly, the very idea of a sociology of scientific knowledge butted against the self-understanding and legitimation of dominant strands of sociology. It is this circumstance, more than others, that makes the place of SSK so problematic within the overall sociological culture, especially in its North American form.

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[8] Harriet Zuckerman's recent full-scale survey (1988) of the sociology of science is, by comparison, notably informed about and courteous toward strands of SSK, while she labors to assimilate this work to the structural-functional tradition with which it is often seen to be in conflict. I should add that, as a participant, I am, of course, wholly satisfied that a sociology of scientific knowledge is both possible and necessary, and that it has accumulated a large body of outstanding empirical work. Likewise, I am satisfied that much—not all—criticism of SSK continues to proceed from an obtuse—and possibly willful—misrepresentation of its central methods and claims (cf Barnes 1994:22–25, Bloor 1991:163–85). Yet my purpose here is not merely to reiterate old arguments in defense of SSK but to try to note some features of the cultural framework in which that misrepresentation is so deeply entrenched.

Therefore, Peter Winch's (1958) critique of enterprises that tried to base an understanding of social action on the methods of natural science was decisive for several practitioners of SSK (Collins 1975:216, 1981a:373, Knorr-Cetina 1981a:148–49, Lynch 1993:40–41, 163, 183, 228). If social science could be construed as fundamentally different from natural science—in its objects and in its appropriate methods—then it followed that the opening up of the natural sciences to sociological understanding need not be seen as a threat to sociology. The pertinence of Winch's views indicates the importance to SSK of intellectual resources coming from the margins of the American sociological profession, and, indeed, from outside of sociology proper.[9] Winch's book significantly stimulated curiosity about the later philosophy of Wittgenstein, especially its analysis of the indeterminacy of "rules," while other British practitioners disputed Winch's distinction between sociology and natural science (Bloor 1983). The intellectual mix that in the 1970s inspired the early sociological studies of such British writers as Barry Barnes, David Bloor, HM Collins, Donald MacKenzie, Michael Mulkay, Richard Whitley, and Steve Woolgar included, to be sure, elements of the classic sociological theory of Durkheim and, more diffusely, of Marx, but also the historiography of TS Kuhn, the comparative cultural anthropology of EE Evans-Pritchard, Mary Douglas, and Robin Horton, philosophical work on the categories of sociological explanation by Alisdair MacIntyre, Basil Bernstein's revisionist sociology of language and education, the relativist philosophy of Nelson Goodman, Mary Hesse's neo-Bayesian philosophy of science, and, especially, a vast body of detailed historical work on the natural sciences in their social and cultural contexts.

In the early and mid 1980s, SSK received an infusion from practitioners trained in, or attracted by, phenomenological and ethnomethodological traditions. Studies by Michael Lynch, Steve Woolgar, Steve Yearley, and Eric Livingston drew significantly on work by Alfred Schutz and Harold Garfinkel

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[9] Winch's work, while influential in British sociological theorizing, is referred to little or not at all in standard American surveys.

(Lynch 1988, 1993:Ch 4). [It was predominantly these writers who imported the tag "social construction" into SSK, most immediately by way of Berger & Luckmann (1966), though others not primarily indebted to phenomenology soon elaborated a modified conception of "social constructionism," different from both its theoretical begetters and from sociological "labeling theory."][10] More recently, such sociologists as Susan Leigh Star, Adele Clarke, Joan Fujimura, and Chandra Mukerji have effected links between SSK and "Chicago School" interactionist sociology of work, occupations, and culture (e.g. Clarke 1990, Clarke & Montini 1993, Star 1989, Star & Griesemer 1989, Mukerji 1989, Fujimura 1987, 1988). And all through the 1980s, social studies of science have been increasingly preoccupied by challenges to several central descriptive and explanatory categories emerging from a Parisian circle centered on Bruno Latour, whose work was itself fundamentally shaped by Nietzschean and Heideggerian philosophical traditions as well as by the techniques of semiotics and anthropological ethnography (Latour 1987, 1988a, 1993).

Only in one respect is SSK typical of the sociological profession: Its practitioners disagree about the very identity of sociology, and, therefore, about the identity of a legitimate sociological framework for the study of their objects. In the late 1970s and early 1980s, Ben-David, meaning to be rude about SSK, observed (1978:203–08, 1981:43–47; cf Zuckerman 1988:513) that few of its leading practitioners were properly trained as sociologists, that they meddled with epistemological concerns best left to philosophers, and that, owing to their amateurism, they were unfamiliar with the history of disaster that was said to be the career of systematic sociological attempts to account for scientific knowledge. Ben-David's description was, to be sure, correct on several points. Few of the founding figures *were* professionally trained as sociologists (Collins 1983a:267–68). On the other hand, a number had natural science backgrounds that discouraged them from confusing the reality of scientific knowledge-making with textbook idealizations. The field was also particularly receptive to the sociological exploitation of historical and philosophical frameworks developed by such writers as Michael Polanyi (1958) and Thomas Kuhn (1962), who did have extensive natural scientific experience.

Moreover, as Ben-David rightly noted, the leading concerns of "British" SSK *were* philosophical and, in particular, epistemological. If scientific judgment and the growth of knowledge could be adequately accounted for by impersonal canons of evidence, logic, rationality, and, especially, of "the scientific method," then, indeed, neither a sociological nor an historically contextual account was appropriate for the interpretation or explanation of scientific knowledge. The "Great Tradition" of Vienna Circle logical empiricism was concerned with providing not a naturalistic account of scientific change and judgment but (as Rudolf Carnap and Hans Reichenbach said) its "rational reconstruction." Yet other philosophers wrote as if "method-stories" were historically adequate, and still others continued to conceive of sociological considerations as potential "pollutants" of authentic science, to be guarded against or relegated to the contingent domain of "contexts of discovery."

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[10] By the early to mid 1970s, phenomenologically inclined sociologists were widely appropriating the tag, and it remains especially fashionable in work on sexuality, deviance, and crime. So far as I can discover, the first uses of the term in titles of studies concerned with science appear in 1976 and 1977; evidently the term reached its height of SSK popularity in the late 1970s and early 1980s (e.g. Latour & Woolgar 1979, MacKenzie 1981a, and Collins & Pinch 1982).

Accordingly, early SSK took it as a primary task to create a legitimate space for sociology where none had previously been permitted, in the interpretation or explanation of scientific knowledge. In just that sense, SSK set out to construct an "anti-epistemology," to break down the legitimacy of the distinction between "contexts of discovery and justification," and to develop an anti-individualistic and anti-empiricist framework for the sociology of knowledge in which "social factors" counted not as contaminants but as constitutive of the very idea of scientific knowledge (e.g. Bloor 1975, Law 1975; cf Fuchs 1992:Ch 2). SSK developed in opposition to philosophical rationalism, foundationalism, essentialism, and, to a lesser extent, realism. The resources of sociology (and contextual history) were, it was said, necessary to understand what it was for scientists to behave "logically" or "rationally," how it was that scientists came to recognize something as a "fact," or as "evidence" for or against some theory, how, indeed, the very idea of scientific knowledge was constituted, given the diversity of the practices claiming to speak for nature (Bloor 1984a,b, Collins 1981b). The current philosophical tag corresponding to SSK is "social epistemology" (Fuller 1988, 1992).

Analytic philosophers of science have not much appreciated, nor in many cases comprehended, the gesture—a "social epistemology" seemed to some a contradiction in terms—and the career of SSK continues to be marked by trench warfare between its practitioners and the dominant tendencies in the philosophy of science (e.g. Brown 1984, 1989, Bloor 1991:163–85). For these reasons, SSK developed partly through efforts to exploit some traditional and nontraditional sociological resources to show—both theoretically and empirically—how a sociology of scientific knowledge was possible, and not as a professional extension of mainstream disciplinary practices into this terrain. On the whole, mainstream sociological practitioners did not want sociology to go in such directions or did not believe that it could be so extended. The over-publicized "warfare" between SSK and the "Mertonians" was, in fact, but a brief early episode in the career of the field and was mainly concerned with such questions of possibility (Collins 1983a:266, 271).

SSK practitioners soon found it more satisfying to do the sociology of scientific knowledge than to argue whether it was possible, and by the early

1980s, they were content to point to a body of detailed empirical studies as strong evidence of that possibility (Shapin 1982). Indeed, early practitioners systematically argued that scientific knowledge could be understood in just the same way as one would go about interpreting any other area of culture—there were no special resources or methods required to account for science (Barnes 1974). So a number of important writers, having established that point of possibility to their satisfaction, saw no special reason to persist with the particular study of the natural sciences and moved on (in whole or in part) to applying the methods and resources of SSK to other areas of culture (notably technology and economics), to debates in the philosophy of knowledge and theories of representation, to social theory, and, notably, to participation *within* such scientific practices as artificial intelligence (e.g. Barnes 1988, Collins 1990, Ashmore et al 1989).

SSK and the Forms of Cultural Inquiry

If intellectual influences on SSK and its diverse disciplinary affiliations make the field marginal to the profession of sociology, its preoccupations, circumstances, and several of its findings ought to make it central to the sociological enterprise, and, indeed, to cultural inquiry as a whole. On the one hand, SSK, like any descriptive or explanatory practice, inevitably deploys our current stock of knowledge about what the world, natural and social, is like. However much practitioners in this area may mean to show that such items as "neutrinos," "neurofibrillary tangles," or "social class" are theorized and socially constructed, the realist mode of speech is ineliminable in practice, and the "phenomenological bracketing" that allows analysts to be curious about how such items are constructed is dependent upon a robust realist idiom in speaking about other items. Skepticism, as Wittgenstein said, takes place on the margins of trusting systems, and radical skepticism is radically disruptive of communicative order (Douglas 1986, Shapin 1994:Ch 1). This is no more than to say that sociologists of scientific knowledge "know" the world that science has depicted as securely as any other competent members of the culture, and that they use this knowledge in producing their accounts.

On the other hand, the practice that seeks to understand science as an historical and social enterprise also demands that analysts be curious about its findings, including the findings about the natural and social worlds that have to be used to implement that curiosity. The realist mode of speech itself becomes an object of curiosity. In this sense, SSK is prone to tension between how it speaks and what it says, and its practice is irremediably embedded in the objects of its inquiry (Barnes 1981:484, 493). While many philosophical and everyday forms of inquiry seek to justify our intuitions about science—its correspondence, its objectivity, its efficacy, and its progressiveness—SSK takes those intuitions as matters to be interpreted and explained (Collins

1981b). That makes SSK at times uncomfortable—to both practitioners and readers of their work—but also fundamental to our culture's self-understanding. Uneasiness in inquiry is often—not invariably—a sign that the inquiry is nearing the heart of the matter, and the claimed hyper-awareness of "postmodernity" is played out in SSK in one of its most acute forms.

The second reason SSK may arguably be central to the sociological enterprise and to cultural inquiry as a whole flows from the categories that traditionally comprised the sociology of knowledge and the changes wrought on these categories by work over the past quarter-century. As Merton surveyed the field in 1945, the sociology of knowledge was the practice that sought to show the influence of social (or "existential") factors upon "mental productions" (Merton 1973; cf Parsons 1949:14). How did social factors condition the form, content, and dynamics of cognitive products? There was social stuff and there was intellectual stuff, and there were (varying) narratives concerned to bridge the Cartesian gulf. That dualism, and that resulting problematic, were accepted by all theorists, no matter what scheme they proposed for doing the connecting (causal, functional, or symbolic), and no matter what exemptions (typically the mental productions of logic, mathematics, and the natural sciences) they stipulated.[11]

The dualism that provided traditional sociology of knowledge with its frame of reference was inherited from ancient lay and philosophical discourse. From the Greek philosophical tradition to early Christianity and on into the culture of seventeenth-century English empiricism and nineteenth-century high romanticism, knowledge was considered to be properly philosophical, sacred, or genuine insofar as the circumstances of its attainment were removed from the domains of the practical and the political (Shapin 1991a,b). Disengagement and disembodiment were ancient tropes of value: Removing knowledge-making from the polis was seen as a technique of transcendence. Accordingly, to say that knowledge was produced in and through mundane interactions between people, as well as between people and reality, was taken just to say that its truth, objectivity, universality, and power were compromised. So far as genuine philosophical knowledge was concerned, the polity was a pollutant. In this way, interpretative and explanatory tasks were embedded—largely unwittingly—in traditional tropes of evaluation. Bacon's idols of the theatre and the marketplace marked the social contamination of knowledge no less than the presentation of Greek and early Christian thinkers as withdrawn and disengaged. From the late 1930s through the 1960s and beyond, the discourse of "internalism" and "externalism" that so fundamentally structured the practice of history and sociology of science took the dualistic juxtaposition of "social" versus "rational," "intellectual," and "evidential" for granted. "The social" was taken as that which was "external" to science, and it was persistently debated by what means authentic science kept "the social" at bay, how and to what extent "social influences" infiltrated science without deleterious effects, or how what seemed to be properly scientific knowledge was "in fact" socially marked ideology (Shapin 1992).

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[11] It has often been insisted that Merton himself (1973) was the father of that "Copernican revolution" in the sociology of science which took true as well as false belief for its legitimate subject, from which it follows, in Bourdieu's opinion (1990:297–98), that writers like Barnes and Bloor were merely "crashing through an open door." It is, for all that, remarkable that Merton never purported to produce a sociological account of what has been called "the technical content" of scientific knowledge, while some of his followers continue to insist very vigorously on the impossibility of any such account.

Some strands of early SSK and related social historical work did indeed deploy the same society-mind vocabulary as traditional sociology of knowledge. Here the task was taken to be the showing of "social influences" on properly scientific knowledge where such "influences" had previously been reckoned not to act. The taken-for-granted equation between the social autonomy and the truth of knowledge was challenged, and a series of empirical studies sought to establish—without a tone of exposé—that even the "hard cases" of claims within the physical and mathematical sciences, taxonomic sciences, and observation-reports were so "influenced": Society, and its concerns, nevertheless "got in" (Shapin 1979, MacKenzie 1978, 1981a). To a number of critics, that sums up the case that SSK argued: Its bearing upon the truth and objectivity of science was taken over from traditional schemes that conceived the social as a "contaminant" (Brown 1989). Where there was "social influence," there the roles of natural reality and rationality were regarded as compromised.

However, this sensibility in fact grossly misrepresents SSK's case for "the social." Rather, the claim was that "the social dimension" of knowledge needed to be attended to in order to understand what counts as a fact or a discovery, what inferences are made from facts, what is regarded as rational or proper conduct, how objectivity is recognized, and how the credibility of claims is assessed. The target here was not at all the legitimacy of scientific knowledge but the legitimacy of individualist frameworks for interpreting scientific knowledge. Attention was drawn to "the social dimension," accordingly, not as a pollutant but as a necessary condition for making, holding, extending, and changing knowledge. In just that sense, the language of "the social" as a "dimension," an "influence," or a "factor" to be juxtaposed with the "factors" of evidence and rationality was rendered problematic (Lynch 1991b). And here, arguably, SSK was the primary field in which that challenge to the traditional dualism was laid down.

The challenge was expressed in varying idioms. From 1979 Bruno Latour repeatedly pointed out that there was undeniably as much (and arguably more) "politics" within the walls of scientific workplaces as there was outside, and that the securing of credibility for scientific claims was a thoroughly social and political process. Thus he highlighted as a potential topic of inquiry the cultural scheme that simply assumed otherwise (Latour 1987: 30, 62). At the same time, the performance of modern political action fundamentally implicated scientific knowledge of what sorts of things existed in the world and how these things acted upon humans. The "missing masses" in existing social and political theory were the "nonhumans" predicated by science and technology. A defensible sociology of science and technology, therefore, had the potential to recast the terms of social theory generally. Signaling the sensibility that sought to remove "the social" from its status as "factor," the second (1986) edition of Latour & Woolgar's *Laboratory Life* deleted the word "social" from its original (1979) subtitle: *The Social Construction of Scientific Facts.* To remove "the social" from the idea of scientific knowledge was said to remove its status as knowledge.

In a more familiar (anti-)epistemological idiom, Mulkay, Barnes, and Bloor sought, from the early 1970s, to establish the inadequacies of individualism for interpreting scientific, or any other form of, knowledge. Here the Kuhnian framework assumes central significance, not least for appreciating the place of SSK vis-à-vis existing sociological traditions. If, for Merton, the answer to the Hobbes/Parsons social-order problem was supplied, in the case of science, by a set of allegedly unique social norms making up the "ethos of science," for Kuhn-inspired SSK, the regulative principles of social order in science were furnished *by scientific knowledge itself.* Within traditions of "normal science," authoritative socializing institutions schooled practitioners in exemplars ("paradigms") of what it was to do good science in particular domains. For early modern chemists, Robert Boyle's J-tube experiment defined a model problem and its model solution, including the embodied representation of what it meant for evidence to confirm or disconfirm a theoretical hypothesis; for late twentieth-century molecular biologists, the "central dogma" (by which DNA produces RNA produces protein) similarly structures practitioners' sensibilities about relevant domains of inquiry, about the directionality of molecular cause, and about the locus of biological meaning.

From a sociological point of view, Kuhnian SSK is at once conservative and radical. On the one hand, it seeks inter alia to answer traditional questions about the grounds of a communal order, and it does so by pointing to the regulative role of norms. While the regulatory relevance of social maxims ("Be skeptical," "Be disinterested") is doubted, the significance of norms for ensuring order and for marking the boundaries of communities is vigorously respecified and reaffirmed in a new idiom. The solidarity of specialist communities—or such solidarity as is found to exist—is coordinated through their specialist knowledge. Good and bad, proper and improper, interesting and banal scientific behavior is recognized and sanctioned by members' knowledge of the natural world. On the other hand, by arguing that the relevant norms are made of the same stuff as the community's technical knowledge, the Kuhnian move overturns the existing sociology-of-knowledge scheme that asks how "society might influence knowledge."

Just because the sway of an evaluative individualism in interpreting our society's most esteemed knowledge has been so strong, SSK's insistence upon a quite elementary feature of the sociological sensibility has seemed to acquire a shockingly radical, even subversive, character. If sociology is the study of the collective aspects of human conduct, then a basic role for the sociological study of scientific knowledge is showing in what ways that knowledge has to be understood as a collective good and its application as a collective process. If there is a fundamental and irreducibly sociological point to be made about scientific knowledge, it is this one. Society—including the specialist societies of scientists—might properly be regarded as a distribution of knowledge, just as the very idea of knowledge depended upon the social relations of knowers (Barnes 1988, Shapin & Schaffer 1985).

Following such writers as Simmel (1950: 313) and Polanyi (1958), it has been noted that modern systems of scientific and technical knowledge are highly differentiated and distributed: No one individual keeps the whole of a discipline's knowledge in his or her head, and even the technical knowledge involved in the conduct of a single experiment in modern physics or biology is typically distributed across a range of specialist actors. In a symbolic interactionist idiom, actors in different "social worlds" are invariably involved in the making of scientific goods (Star & Griesemer 1989). And, while this distributed character is very evident in modern scientific practice, in principle it is arguably just as pertinent as a description of the "simpler" scientific cultures of past centuries. The director of a large-scale experiment in high-energy physics does not have direct knowledge of every aspect of that experiment, just as an individual seventeenth-century English natural philosopher would typically not have direct evidential warrant for his knowledge of icebergs, comets, or the flora of the Americas. As a general matter, practitioners rely massively upon others for their knowledge. For there to be solutions to the problem of knowledge there have to be practical solutions to problems of trust, authority, and moral order (Barnes 1985:49–58, 82–83). Individualist philosophies of knowledge at least since Locke have persistently argued that knowledge is genuine and secure when its warrants are direct, experiential, and individual (Shapin 1994:Ch 5). If that is the case, then the sociological sensibility would suggest that there is perishingly little genuine and secure scientific knowledge in the world. Yet that is *not* what sociologists of scientific knowledge have argued: Scientific knowledge is as secure as it is taken to be, and it is held massively on trust. The recognition of trustworthy persons is a necessary component in building and maintaining systems of knowledge, while the bases of that trustworthiness are historically and contextually variable. This core sociological insight into the collective nature of knowledge has enormous potential to generate detailed comparative studies of the moral economies of science, but, perhaps owing to the largely philosophical concerns of many sociologists of scientific knowledge, the point has as yet been made, for the most part, at a programmatic level.[12]

A fundamental sociological collectivism applies not just to describing the conditions in which it can rightly be said that individuals have knowledge but also to the means by which knowledge is acquired, applied, and changed. Scientists' knowledge of specialist domains of the natural world, like that of children, is for the most part initially acquired via trusted sources. The proper applications of terms like "chicken," "dog," "electron," and "ideal gas" are not logically fixed; rather, how such terms are used, whether by scientists or laity, is adapted to a range of contingent circumstances, including the weight of custom and convention and the purposes people may have in representing the world. This is the sense in which it is said, following Durkheim and Mauss, that the classification of things reproduces that of people (Bloor 1982). When people confront the experience of their senses, they do so within an already existing structure of knowledge given them by their community and within a structure of purposes sustained by their community. Nor, when new experience is confronted, is it logically determined how such experience is to be sorted out with respect to existing schemes: whether it is to be counted as evidence confirming or disconfirming some theory, whether it is to be bracketed, subjected to taboo, or filed away, to be dealt with another time. It is people's goal-orientation—the pragmatic structure of the community to which they belong—that judges among possible courses of action. Much of the theoretical development of SSK through the 1970s and early 1980s concentrated upon elaborating a fully general sociological framework for interpreting knowledge-acquisition and concept-application (Barnes 1982a,b,c, 1983). And, despite the fact that this work developed without evident specifiable intellectual "influence" from American pragmatist philosophy, it is wholly compatible with pragmatism, and, by extension, with strands of academic sociology—those of Mead, Blumer, and their progeny—that drew inspiration from James and Dewey.

In this way, SSK opposed philosophical rationalism—the view that scientific judgment is sufficiently determined by unambiguous criteria of method—by asserting the contingency and the locality of judgment. Rules did not sufficiently explain scientific judgment; the way in which rules were identified and used was itself a topic for contextual inquiry. Why is it that, since one can "rationally" continue the series 2, 4, 6, 8 ... in any number of ways, the "right way" of going on in an arithmetic class is "10" whereas at an American sporting event it is more likely to be "who do we appreciate?" (Collins 1992:12–16).[13] Right conduct is tied to place and purpose. The in-principle "interpretative flexibility" of rules is securely settled in practice by local notions of decorum.

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[12] An insistence that SSK should be concretely operationalized in such ways has informed some criticism that it "has not developed a fully-fledged sociological account of science" (Fuchs 1992:Ch 2, Hagendijk 1994:135). Once more, an accusing finger is pointed at excessively philosophical concerns.

By contrast with rationalism, such SSK writers as Barnes and Bloor explicitly endorse a robust realism and, indeed, have noted that the idiom of sociological realism presupposes a corresponding natural realism: "No consistent sociology could ever present knowledge as a fantasy unconnected with our experience of the material world around us" (Bloor 1991:33) or "[T]here is indeed one world, one reality, 'out there,' the source of all our perceptions ... " (Barnes 1977:25–26, cf 1992, Barnes & Bloor 1982).[14] What one cannot do, if one proposes disinterestedly to interpret varying beliefs about nature, is to use one particular account—usually that of modern science—to gauge the validity of others. That would be to include the answer in the premises (Barnes 1992). All institutionalized beliefs about nature are causally connected to reality, and all are on a par with respect to the manner in which their credibility is to be interpreted. Judgments of what is the case, like judgments of what is rational, are locally accomplished.

Situated Knowledge and Its Travels

Indeed, the best way of summing up the thrust of a great deal of work in SSK, and in related history and philosophy, produced from the mid-1970s to the present, is to see it as concerned to show in concrete detail the ways in which the making, maintaining, and modification of scientific knowledge is a local and a mundane affair. Here the case-study method—occasionally belittled as piling on more "proof" of "the same sociological theory"—is beautifully suited to the business at hand, since its "theory" of science is more "shown" than "said, and since its practitioners are rightly skeptical of narratives that purport to distill the "essence" of practices as varied as those that are, and have been, called "scientific."[15] Quite unlike past traditions in the sociology of science, SSK case studies are typically tightly focused upon specific passages of scientific practice. Their detailed ethnographic or historical character is geared to breaking down the "enchantment" produced by distance (Collins 1992:144–45)—and hence the appeal of idealized "method-stories"—and to displaying the contingency, informality, and situatedness of scientific knowledge-making.

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[13] The sociological *locus classicus* for treatment of Wittgenstein on rule-following is Winch (1958), and in SSK, Collins (1992:Ch 1), Bloor (1983, 1992), Lynch (1992a, 1993:Ch 5).

[14] The puzzle of why, despite these insistences, critics of SSK make it out as a recommendation of "social variables" *versus* the "data from the empirical world" (e.g. Cole 1992:2, 12, 229) can best be resolved by noting the hold of *individualistic empiricism* that makes such dualistic language seem natural. Even Collins's famous dictum (1981c:54, cf Collins & Cox 1977:373, Collins 1981b:216, 1992:16, 174) that "the natural world in no way constrains what is believed to be" is repeatedly specified not as an epistemological or ontological judgment but as a "methodological prescription"—how analysts should proceed if they are genuinely curious about the bases of varying beliefs.

These "localist" arguments have proceeded along a number of lines. First, science-making is identified as a mundane matter. Exploiting work by such writers as TS Kuhn (1970), Peter McHugh (1970), Jeff Coulter (1975), Harvey Sacks (1984), and Melvin Pollner (1987), much empirical and theoretical research has been devoted to showing that the making of scientific knowledge can be sufficiently accounted for by ordinary human cognitive capacities and ordinary forms of social interaction (Barnes 1976, Feyerabend 1978, Lynch 1985, Collins 1992, Shapin 1994). Once the grand narratives of unique scientific "norms" and unique scientific "method" lost their compulsion, curiosity was unleashed about how scientists used "secular" ways of thinking and acting to build up their exceptionally authoritative systems of knowledge (Barnes 1974, Lynch 1985, Latour 1987, 1988a, Latour & Woolgar 1986, Turner 1989). Almost needless to say, mundane means can produce widely differing products—just as stone, mortar, and rules of thumb can produce results as varying as a worker's cottage and Durham Cathedral—and saying that science ought to be understood as a typical form of culture is, of course, not the same thing as saying that it is no different from other forms of culture. Arguably, sociologists and historians are only now in a fit position naturalistically to address relevant questions about the character and bases of cultural difference.

Second, since it is argued that no scientific claim "shines with its own light"—carries its credibility with it—sociologists and historians have become intensely interested in the specific processes of argumentation and political action whereby claims come to be accepted as true or rejected as false. The gap between individual experience and public knowledge must always be filled by persuasion, and the resources available to make claims persuasive can include any tools the local culture makes available and is responsive to. The "rhetorical turn" in SSK has now yielded a large body of empirical work on the techniques of scientific exposition—the textual and informal means by which scientists labor to persuade others, to extend experience from private to public domains, to assure others of their disinterestedness, to assert the significance of their claims, to argue that their body of knowledge is indeed "scientific" (Woolgar 1976, 1989, Yearley 1981, Gilbert & Mulkay 1984, Shapin

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[15] The link between the case-study method in science studies and the attempted revival of the casuistical tradition in ethics is worth pursuing. Both instantiate doubt about the regulatory role of abstract theories (see e.g. Jonsen & Toulmin 1988, Bauman 1993).

1984a, Pinch 1985, Latour 1987, Bazerman 1988, Myers 1990, Dear 1991, Gieryn 1992).

Third, stress has been put upon the embodied character of scientific knowledge. It is noted that scientific competences are not effectively transferred from one individual to another, and from one place to another, solely by recipes, algorithms, or formal rules of proceeding. Much empirical work has addressed the embodied nature of scientific know-how and the embodied vectors by which it travels, whether that embodiment is reposed in skilled people, in scientific instruments, or in the transactions between people and knowledge-making devices. Collins's now-classic study (Collins & Harrison 1975) of the transfer of laser-building skills as embodied tacit knowledge built upon an appreciation of science as craftwork, and that work has in turn been extended by ethnomethodological and symbolic interactionist studies of modern biology (Lynch 1985, Jordan & Lynch 1992, Clarke & Fujimura 1992, Cambrosio & Keating 1988) and mathematics (Livingston 1986), and by historical work on physics (Shapin & Schaffer 1985:Ch 6, Morus 1988, Schaffer 1989, 1992a,b, Warwick 1992–1993), astronomy (Schaffer 1988, Van Helden 1994), chemistry (Roberts 1991, Golinski 1994), genetics (Kohler 1994), and medicine (Lawrence 1985).

Finally, empirical and theoretical work has addressed the physical situatedness of scientific knowledge-making (Ophir & Shapin 1991). The grand narrative of inherent scientific universality deflected attention away from place: Situatedness was the mark of lower cultural forms, and science, as Durkheim announced (1972:88), was "independent of any local context." Again, structures of evaluation weighed against localist perspectives on science. Yet, from the point of view of naturalistic inquiry, science is undeniably made in specific sites, and it discernibly carries the marks of those sites of production, whether sites be conceived as the personal cognitive space of creativity, the relatively private space of the research laboratory, the physical constraints posed by natural or built geography for conditions of visibility and access, the local social spaces of municipality, region, or nation, or the "topical contextures" of practice, equipment, and phenomenal fields (Lynch 1991a, Gooding 1985, Shapin 1988). Here SSK has not merely attempted a resuscitation of interest in the "contexts of discovery" abandoned by philosophers, it has also opened up new curiosity about structures of "justification" and the translation of knowledge from place to place.

It is impossible to treat localist sentiments in the study of science without engaging with the contribution of feminist writers, and it is equally impossible briefly to summarize one of the modern academy's most heterogeneous and politically charged genres. (Feminist views of science, and their vexed relations with SSK and social theory, merit systematic survey on their own by someone competent in this contested domain.) One strand of feminist writing on science—that which views the whole of post-seventeenth-century science as "essentially masculinist"—is not, indeed, compatible with post-Kuhnian sociological localism: Grand narratives about what science "essentially is" or about its "essential preoccupations" were just what the contextual and naturalistic turns were meant to reject. To say that science, across a broad sweep of history and cultures, was "essentially" informed by gender preoccupations, or, with the "standpoint" theorists, that women-as-victims are "epistemologically privileged," represents much the same kind of sensibility as those that announced that science was "essentially" about class relations, or about the abstraction from common sense, or that a class of free-floating intellectuals existed and enjoyed epistemological privilege. Yet other versions of feminist science studies are perhaps best seen as tributaries of SSK and related streams feeding the river of embodied localism. In criticizing individualist, rationalist, and disembodied views of science, such feminists as Dorothy Smith and Lorraine Code urge perspectives similar to those of phenomenologically informed SSK, while Donna Haraway's flamboyant antimodernism tackles the great Enlightenment dualisms—nature/culture, human/nonhuman, etc—in order to display their historical specificity and thereby to reject them. Such feminist work often has its own intellectual and frankly political agenda, but it is, nevertheless, intelligible to see it as proceeding from sensibilities similar to SSK localism. It is another idiom for identifying and interpreting "situated knowledges" (Haraway 1991: Ch 9).[16]

The localist thrust of recent SSK has generated one of the central problems for future work. If, as empirical research securely establishes, science is a local product, how does it travel with what seems to be unique efficiency? One appeal of the modernist grand narratives of reason, reality, and method was the table-thumping response they offered to questions about the travel of science. If, however, universality can no longer be accepted as an assumption flowing from the very nature of the knowledge or the "method" for making it, then what are the mundane means that so powerfully effect the circulation of science? And is that travel, indeed, to be treated as real, or is what circulates yet another illusory grand narrative?

In this connection, SSK has thrown up one particularly well-developed framework for engaging with the problem of travel. Bruno Latour and his associates have offered what is best taken as a descriptive vocabulary for construing scientific success and power (Callon et al 1986, Latour 1987, 1988a). "Technoscientific" knowledge—both propositional claims and the knowledge embodied in technology—are held stable and treated as true, insofar as they are constituted as obligatory passage points for many actors' work. Think, for example, of the physical knowledge embodied in a thermometer. To contest that knowledge would be to fight on many fronts against many institutionalized activities that depend upon treating the thermometer as a "black box." Intercalating science or technology into larger and larger networks of action is what makes them durable. When all the elements in a network act together to protect an item of knowledge, then that knowledge is strong and we come to call it scientific. The central modern scientific phenomenon to which attention is directed is thus metrology—the development of standards and their circulation around the world (Schaffer 1992b, O'Connell 1993, Barry 1993, Shapin & Schaffer 1985:Ch 6). The suggestion is that the wide distribution of scientific knowledge flows from the success of certain cultures in creating and spreading standardized contexts for making and applying that knowledge. Phrased in this way, Latour is offering a new, but sociologically recognizable, vocabulary for describing institutionalization.[17]

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[16] An entry to the contest between "standpoint," "empiricist," and "postmodern" feminist writing on science can be secured via Bordo (1987), Harding (1986), Code (1991), Haraway (1991), Keller (1983, 1986, 1988), Longino (1990), Merchant (1980), Noble (1992), Richards & Schuster (1989), Schiebinger (1989), and Smith (1990).

The resources available to effect this intercalation include a range of discursive and technical means. Artfully deployed rhetorical maneuvers delete the grammatical modalities that qualify claims: The move from "Bloggs says," to "It is the case," to the submergence of a claim in taken-for-granted background assumptions in yet another claim is a way of describing the ascent to truth. Scientific rhetoric induces readers to go in only one direction, that pointed out by the author. Theatres of persuasion can be mounted: The dramatic staging of such field trials as those laid on by Louis Pasteur at Pouilly-le-Fort were at once spectacles of confidence and of efficacy. Husbandmen who wanted their livestock protected from anthrax were shown that, to achieve their ends, they had to go through Pasteur's Parisian laboratory and that Pasteur had to be treated as a transparent spokesman for natural reality. Interests can be generated and translated. Potential consumers of technoscientific goods can be told that they really need these goods in order to attain their existing goals, or that their goals should be modified so as to achieve even more benefits than they had envisaged. Allies have to be enrolled by such persuasive acts and then controlled so that they do not fall out of alignment. Technical means can be found that make the exercise of power over a distance effective. The "immutable mobiles" represented by print and graphic technologies can circulate with minimum modification and represent a world-to-be-controlled on the convenient scale of a tabletop (Latour 1987, 1988a).

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[17] Here and elsewhere I knowingly "make a mistake"—common to Anglophone readers—of assimilating Latour's work to existing currents of sociological theorizing. This is to set aside the radical recasting of the terms of theorizing sought by Latour's "amodernist" metaphysics and its bearing on a proper ontological vocabulary for referring to human and nonhuman actors. Ironically, however, this very "misunderstanding" is proving to be the major vehicle for absorbing his work outside of the French cultural context. In Latourian vocabulary, therefore, "enrollment" is proceeding apace while the "control" of allies is notably slack.

Latour's inventory of the means by which technoscientific knowledge is extended amounts to a descriptive vocabulary of power as well as of institutionalization. Pasteur grows great and powerful, his knowledge is extended and made durable, insofar as these effects are achieved. And, while Latour repeatedly disavows both psychological theorizing and explanatory intent (Latour 1988b), the agent deploying these resources is recognizable from Machiavellian and Hobbesian accounts of human nature: Pasteur is displayed as animated by a will to power and domination, and his readers' decisions to acquiesce or submit are treated as those of pragmatic maximizers-of-marginal-advantage. The language of militarism and imperialism is natural to this account, and its suitability is explicitly asserted.

Indeed, one way of situating the Latourian framework within sociological traditions would be to see it as unwinding the solution of a social-order problem which Parsons proffered. The "dog that doesn't bark" in Latour's sociology is, indeed, a conception of normative order. All these effects of order and its extension are to be achieved by constant practices of enrolling, controlling, and invigilating. Latourian social order appears all natural fact and no moral fact. Therefore, the onus on those who suspect the adequacy of Hobbesian accounts of order would be to produce a post-Mertonian picture of the moral economies of science—the locally distributed conceptions of legitimacy, authority, and trust by which scientific knowledge comes to be a collective good, the moral-pragmatic preconditions for intersubjectivity, and the mundane means by which moral orders of scientific knowledge-making come to be distributed around the world.

Despair and Decorum: SSK Dissolved?

No sooner had the dust settled on the first claims of SSK "success" than a number of leading practitioners announced that SSK was a failure and required replacement by more "radical" next-things. The grounds of this despair were several. The program of "discourse analysis" launched in the early 1980s by Michael Mulkay and his students criticized SSK as a form of overenthusiastic sociologizing (Gilbert & Mulkay 1984, Mulkay et al 1983). Rightly observing that scientists' accounting procedures were heterogeneous—sometimes they talked as if work were governed by evidence and method and sometimes as if it were shaped by contingent personal and social factors—Mulkay announced that sociologists could never produce "definitive" descriptions or explanations of science, dependent as they were on the jumble of scientists' talk. At most and at best, sociologists should document and classify scientists' accounts. Definitive description could presumably still be attained, but only by shifting down a referential level, from accounts of what science is to accounts of scientists' accounts of what it is.

In an allied move some of Mulkay's students cast a skeptical eye on the particular form of "interest-explanations" produced by writers in the "Edinburgh School." These too were condemned as instances of sociological over-optimism. How could one use "social interests" as explanations of scientists' judgments when those "interests" ought properly to be seen as objects of negotiation, constructed in the course of interaction (Woolgar 1981, Yearley 1982)? Interests were said to be inadequately established on empirical foundations. They were circularly inferred from the effects they were meant to explain, and they were, for these reasons, illegitimately smuggled into sociological explanations. Here too the "radical next move" out of SSK was, by another description, the recommendation of judicious retreat from a methodological impasse.

Discourse analysis and closely related critiques of SSK have now largely been abandoned. SSK writers embraced the theoretical character of their explanatory notions and wondered what other status "interests" could have. Nor were they content to reduce "interests" to "interest-talk." As Barnes sourly put it, "With cream-cakes there is a chance of satisfying hunger—with accounts of cream-cakes there is not" (Barnes 1981:492–93; cf MacKenzie 1981b, Shapin 1984b, Collins & Yearley 1992:303–04). If proponents of SSK and many philosophers of science claimed that scientific theorizing can never be fully justified—uniquely determined by the evidence—then, of course, the same condition applied to social science theorizing. Nor were the foundational claims made for "discourse" any less vulnerable than explanatory items: The forms of talk discerned by discourse analysts went "beyond the evidence" no less than any other sort of theoretical construct. The "radical" program of discourse analysis was identified as a form of that not-very-radical doctrine, positivism.

Emerging together with the discourse analytic critique was a "reflexive" program. Proponents noted that the discursive forms in which much SSK work was embedded shared with science a realist mode of speech in which authority-claiming authors referred "disinterestedly" to real states of affairs in the social world. This was said to be an unsatisfactory situation, protecting from inquiry that which ought properly to be the object of inquiry. Here the proposed "radical next move" was the purposeful subversion of realist and referential modes of speech. "New literary forms" shattering these univocal and referential modes were to be put in place of descriptions and explanations of scientific conduct, and the objects of inquiry were to be shifted away from "science" and "society" to the "referring self" which had traditionally reported upon "science" and "society." Such questions were asserted to be deeper and more fundamental, and the overarching problem to which reflexivity addressed itself was no less than that of how we know anything at all (e.g. Ashmore 1989, Woolgar 1988b, Mulkay 1991:xvii). SSK was to be not exploded but imploded. To the objection that such practices were getting nowhere, it was robustly replied that "getting nowhere should be seen as an accomplishment" and that the "somewhere" purportedly reached by SSK was in fact nowhere at all (Collins & Yearley 1992: 305).

"Next-step" radicalism again appeared to those defending SSK as yet another counsel of despair (Pinch 1993, Pinch & Pinch 1988, Collins & Yearley 1992:305–9). "New literary forms" arguably have the claimed capacity to break up authority only in the case of quite dim readers. Either no specifiable arguments or claims about science are being advanced through these forms (in which case no note need be taken of them by those concerned with describing or explaining science) or some definite proposition is being advanced (in which case readers would attempt to discern it in the mélange of voices). As with discourse analysis, reflexive writers, for all their trying, could not wholly avoid the realist mode of speech, and one could scarcely imagine that their claims would be in any way comprehensible if they had.

Discourse analysts and reflexivists were partly inspired by ethnomethodology, and, indeed, the specifically ethnomethodological critique of SSK[18] shares their suspicion of allegedly over-confident sociologizing and their attempt to shift attention from "why-questions" to "how-questions."[19] Just as ethnomethodologists condemn the formalism, the reductionism, and the scientism of academic sociology, so they consider the social explanations of science proffered by SSK to be impoverished. Like the stylized accounts of social behavior produced by mainstream sociologists, SSK is considered to be insufficiently curious about the methods by which both scientists and those who study them produce accounts. Ethnomethodologists also reject asocial philosophical rationalism as a response to questions about the grounds of social order in science: The production of social order in scientific disciplines is said to be, in Lynch's formulation, "inseparable from the dense texture of understandings and concerted practices that make up disciplinary specific language games." The traditional concepts and methodological stances of sociology are "simply overwhelmed by the heterogeneity and technical density of the language, equipment, and skills through which [scientists] make their affairs accountable" (Lynch 1993:298–99).

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[18] It is notoriously difficult to pin down ethnomethodological doctrine. Here I broadly follow the leading ethnomethodological analyst of science, Michael Lynch (1993:Chs 1, 4–7).

[19] Here it is unclear whether the position is (i) that "how-questions" are more fundamental and should *precede* posing "why-questions"; (ii) that existing responses to "why-questions" are inadequate; or (iii) that "why-questions" are illegitimate in principle and ought to be given up. In the event, it remains uncertain how, in any strong sense, "how-questions" could be thought to *replace* "why-questions."

Consequently, ethnomethodology, like strands of SSK, has commended ever more finely grained studies of day-to-day scientific practice. It has been a major inspiration to work displaying the mundane and everyday character of knowledge-making, while, on a programmatic level, it has expressed doubt that sociologists currently possess the conceptual resources to explain or even schematically to describe scientific order. To that extent, the ethnomethodological posture is a form of asceticism. Yet that same unremitting asceticism has made ethnomethodologists reluctant to advance some of the more expansive methodological claims staked out by other critics of SSK. Ethnomethodology, at least in Lynch's form, does not assert a privileged stance for any form of sociological accounting; it does not see foundations or Archimedean points available anywhere; and it recognizes no reason to be troubled by or to abandon a realist mode of speech. What makes critics of ethnomethodology despair is just the scope of its ascetic modesty.

Finally, for the past ten years or so, Bruno Latour and his associates have publicized their view that sociological explanations of scientific judgment are outmoded, fundamentally flawed, and due for replacement. The traditional vocabulary of the sociology of knowledge, which asked how "social factors" influenced scientific knowledge, needed to be replaced with studies of how nature and society were "co-produced." SSK was to be applauded for its devastating critique of philosophical rationalism, while its residual ambition to explain nature by reference to society was to be definitively rejected. Just as philosophers were wrong to use natural reality to explain scientists' beliefs, so sociologists were wrong to use social reality toward that end. Analysts were told to be as curious about how society was constructed as they were about the construction of natural knowledge. What was wrong with SSK was that it was, after all, a form of sociology, using the categories and seeking the goals of the sociological realist: "[T]he social sciences are part of the problem, not of the solution" (Latour 1988b:161).

The notion of the agent—taken as the volitional human actor—is central to the sociologist's vocabulary, and it is in connection with Latour's attempted reconceptualization of actors that his work has generated the greatest excitement, bafflement, and exasperation. Agency, like "interests" and "nature," is to be regarded as the outcome of controversies, and we must not use such outcomes to explain the career of controversies. Accordingly, Latour means to develop a mode of talking about science and society that does not prejudge the location of agency, in particular as between humans and nonhumans: "[I]t is very important ... not to impose any clear distinction between 'things' and 'people' in advance" (Latour 1987:72). In present-day science studies, confusion reigns about whether what is being offered is a scheme identifying the semiotic equivalence of human and nonhuman "actants"—which, while exotic to Anglophone cultural inquiry, does not necessarily impinge upon ordinary realist speech—or whether genuine ontological claims are being made, with attendant prescriptions for proper speech in science studies and in the wider culture.

It is this aspect of Latour's work that is currently proving most attractive to analysts of science with "posthumanist" sensibilities. So Andrew Pickering—formerly a leading exponent of SSK—now advocates a "drastic overhaul of some of our most basic intuitions ... about the world, human and nonhuman"; "[o]ne very distinctive feature of modern technoscience is ... its capacity to unleash upon the world new and nonhuman actors ... " (Pickering 1993a:104, 112; also 1993b, Law 1986a,b). Latour's "actor-networks" and Haraway's "cyborgs"—part human, part nonhuman—transcend the "discredited" humanist and modernist dualisms and are the appropriate units of analysis for writers who wish to talk about making society and making science in the same idiom and without commitment to a putatively modernist ontology. Anyone who wishes to understand modern science and modern society must supply themselves with a new way of talking that reflects the new realities.[20] Like the seventeenth-century "moderns," some postmoderns evidently still yearn for a privileged language whose recommendation over alternatives is that it mirrors the order of existence.

Archimedes' s Return

These critiques of SSK are a heterogeneous lot, and it would be wrong to assimilate them too confidently to a common source or sentiment. There are, nevertheless, some family resemblances. First, the critiques proceed largely through identifying SSK as a form of sociology. Its sins are said to consist in its genetic relationship with the parent that commonly denies the offspring as its own. That this irony has largely escaped practitioners presumably stems from the circumstance that so few of them have substantial commitments to the parental discipline. Almost needless to say, there is no reason automatically to deprecate that circumstance or these criticisms. Neither commitment to fundamental sociological resources nor the capacity to contribute to sociological inquiry necessarily depends upon the forms of professional membership. Nor is it a prudent course for an academic discipline to ignore or seek to ban fundamental criticism. Indeed, the baroque reflectiveness of the science studies community throws into relief major features of the sociological enterprise which more complacent and peaceable specialities are less commonly obliged to confront.

Second, these critiques of SSK, and, by extension, of sociology, have a skeptical character. Typically, they are skeptical about the claimed capacity of sociological categories to explain or reliably describe the scientific objects of inquiry. Skepticism has an ancient pedigree; it corrodes complacency and convention, and for that reason alone the skeptic who makes life so awkward for the securely institutionalized practitioner should be cherished like the most maddening of mad uncles in a well-knit family. As Collins (1992:6) puts it, skepticism has the virtue of being a "safe, legal and inexpensive [way] to loosen the trammels of commonsense perception." In this case, the skeptic's voice has challenged the legitimacy with which sociological descriptive, interpretative, and explanatory categories have been applied, and they have challenged the validity of the categories themselves. Versions of this skepticism target not only the categories of academic sociology but, importantly, those of realist modes of speech entrenched in our own culture.[21] SSK itself is, after all, a form of skepticism—for example, with respect to the traditional vocabulary of "social versus cognitive factors." The effect of this skepticism—both that of SSK and of its critics—has been, in my view, overwhelmingly constructive. If, indeed, there was any taken-for-grantedness about what it was to give a sociological description, interpretation, or explanation of science, it has now been buried under an avalanche of methodological self-consciousness.

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[20] It is not at all clear whether such claims are indeed specifically tied to nineteenth- or twentieth-century realities, or whether they are meant to have wider temporal scope.

Third, and arguably in tension with the skeptical posture, these critiques—with versions of ethnomethodology probably excepted—have also typically betrayed a millenarian optimism. Existing sociology is said to be insecurely founded. Yet if only we could get our concepts or discourse right, if only we could take one more reflexive turn, if only we could go down one more analytic level, if only the right, theoretically neutral metalanguage could be devised, then at last we would reach intellectual terra firma and all would be well. However, far from being a "radical next move," there are no intellectual aspirations more traditional than the quest for foundations: a pure and uncompromised place beneath, above, beyond, or apart from the compromised categories of the culture to which intellectuals mundanely belong. In other moods, critics of SSK have themselves made major contributions to discrediting foundationalism. Yet in their struggle to escape the constraints of sociology, they have fallen into the oldest temptation ever to afflict intellectuals. If the move from traditional sociology of knowledge to SSK was the abandonment of pretensions to privilege and of "the Archimedean point," then the unwitting thrust of these critics of SSK is that such a point can, after all, be found.

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[21] And here the break between *interpretative* sociological goals and strands of postmodern science studies and Latourian practice is most apparent, since, to my knowledge, no past or present-day scientific community trades in "stronger or weaker heterogeneous networks of actants" while all consequentially mark out domains of the human versus the nonhuman.

If there is an authentic sociological voice to be set against individualism, empiricism, and positivism, then that voice says "It cannot be done"—not in science and not in the study of science. The "cage" from which the critics evidently seek escape is not just sociology, but the realist mode of speech which sociology shares with everyday talk. That robust realism is said to be the problem to which there must be a remedy. To be sure, the categories of mainstream sociology are not immune from important criticism just because they are a version of the realist mode of speech, but neither can criticism intelligibly suppose that the realist mode can be replaced. The "cage" from which "escape" is sought is, in fact, a condition of such liberty as we enjoy. Intellectuals are not obliged to leap free from their culture in order to subject their culture to questioning, nor must the great, and allegedly "modernist" or "humanist" dualisms be replaced in order to be skeptical of them. Notice, for example, that Latour's idea of "heterogeneous networks" is wholly intelligible, and that the condition of its intelligibility is reference to entities plucked from the culture's existing realist repertoires: human, nonhuman, science, society. And if "modernist" dualisms were a "trap," then it would follow that late twentieth-century culture could contain no such thing as a "materialist theory of the mind." The fact that there is such a theory indicates that we are not, evidently, ensnared by the categories of realist language at all.

There are, however, limits to skepticism about the categories of the common culture, and those limits are posed by the boundaries of communication. We can develop and put in place arcane languages, but we cannot ensure that others will hear us. Communicative orders are grounded in local natural attitudes and local realist idioms.[22] If we wish effectively to speak to a specified community, we are obliged to share its realist idiom. And if we want to communicate at all then we are obliged to employ some version of the realist mode of speech. That obligation is, properly speaking, a constraint. It means, in the present case, that intellectuals' intelligible communication about modern scientific culture will always be compromised by the cultural categories shared between ourselves, the laity, and the scientists we talk about. And if that speech is not so compromised, then it will not be intelligible. Discontent with that formulation would, indeed, be a measure of the extent to which sociology has been rejected or ignored.

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[22] See Collins's argument (versus Latour) in favor of "sociological realism" as sociological decorum (Collins & Yearley 1992). No one realist mode is privileged, but we can and should, Collins says, seek to "alternate" between realisms. We suspend irony about our local realist presumptions as a "methodological convenience."

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Literature Cited

Ashmore M. 1989. *The Reflexive Thesis: Wrighting the Sociology of Scientific Knowledge*. Chicago: Univ. Chicago Press

Ashmore M, Mulkay M, Pinch T. 1989. *Health and Efficiency: A Sociology of Health Economics*. Milton Keynes: Open Univ. Press

Barnes B, ed. 1972. *Sociology of Science*. Harmondsworth: Penguin

Barnes B. 1974. *Scientific Knowledge and Sociological Theory*. London: Routledge & Kegan Paul

Barnes B. 1976. Natural rationality: a neglected concept in the social sciences. *Philos. Soc. Sci.* 6:115–26

Barnes B. 1977. *Interests and the Growth of Knowledge*. London: Routledge & Kegan Paul

Barnes B. 1981. On the 'hows' and 'whys' of cultural change. *Soc. Stud. Sci.* 11:481–98

Barnes B. 1982a. *T. S. Kuhn and Social Science*. London: Macmillan

Barnes B. 1982b. On the implications of a body of knowledge. *Knowledge* 4:95–110

Barnes B. 1982c. On the extensions of concepts and the growth of knowledge. *Sociol. Rev* 30:23–44

Barnes B. 1983. Social life as bootstrapped induction. *Sociology* 17:524–45

Barnes B. 1985. *About Science*. Oxford: Blackwell

Barnes B. 1988. *The Nature of Power*. Cambridge: Polity

Barnes B. 1992. Realism, relativism and finitism. In *Cognitive Relativism and Social Science*, ed. D Raven, L van Vucht Tijssen, J de Wolf, pp. 131–47. New Brunswick, NJ: Transaction

Barnes B. 1994. How not to do the sociology of knowledge. In *Rethinking Objectivity*, ed. A Megill, pp. 21–35. Durham, NC: Duke Univ. Press

Barnes B, Bloor D. 1982. Relativism, rationalism and the sociology of knowledge. In *Rationality and Relativism*, ed M Hollis, S Lukes, pp. 21–47. Oxford: Blackwell

Barnes B, Edge D, eds. 1982. *Science in Context: Readings in the Sociology of Science*. Milton Keynes: Open Univ. Press

Barnes B, Shapin S, eds. 1979. *Natural Order: Historical Studies of Scientific Culture*. London/Beverly Hills, CA: Sage

Barry A. 1993. The history of measurement and the engineers of space. *Br. J. Hist. Sci.* 26: 459–68

Bauman Z. 1993. *Postmodern Ethics*. Oxford: Blackwell

Bazerman C. 1988. *Shaping Written Knowledge: The Genre and Activity of the Experimental Article in Science*. Madison: Univ. Wisc. Press

Ben-David J. 1971. *The Scientist's Role in Society: A Comparative Study*. Chicago: Univ. Chicago Press

Ben-David J. 1978. Emergence of national traditions in the sociology of science: the United States and Great Britain. In *Sociology of Science*, ed. J Gaston, pp. 197–218. San Francisco: Jossey-Bass

Ben-David J. 1981. Sociology of scientific knowledge. In *The State of Sociology: Problems and Prospects*, ed. JF Short, pp. 40–59. Beverly Hills, CA: Sage

Berger P, Luckmann T. 1966. *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*. New York: Doubleday

Bloor D. 1975. Psychology or epistemology? *Stud. Hist. Philos. Sci.* 6:382–95

Bloor D. 1982. Durkheim and Mauss revisited: classification and the sociology of knowledge. *Stud. Hist. Philos. Sci.* 13:267–97

Bloor D. 1983. *Wittgenstein: A Social Theory of Knowledge*. London: Macmillan

Bloor D. 1984a. A sociological theory of objectivity. In *Objectivity and Cultural Divergence*, ed. SC Brown, pp. 229–45. Cambridge: Cambridge Univ. Press

Bloor D. 1984b. The sociology of reasons: Or why 'epistemic factors' are really 'social factors.' See Brown 1984, pp. 295–324

Bloor D. [1976] 1991. *Knowledge and Social Imagery*. Chicago: Univ. Chicago Press. 2nd ed.

Bloor D. 1992. Left and right Wittgensteinians. See Pickering 1992, pp. 266–82

Bordo S. 1987. The Cartesian masculinization of thought. In *Sex and Scientific Inquiry*, ed. S Harding, J O'Barr, pp. 247–64. Chicago: Univ. Chicago Press

Bourdieu P. 1990. Animadversiones in Mertonem. In *Robert K. Merton: Consensus and Controversy*, ed. J Clark, C Modgil, S Modgil, pp. 297–301. London: Falmer

Bourdieu P. 1991. The peculiar history of scientific reason. *Sociol. Forum* 6:3–26

Brown JR, ed. 1984. *Scientific Rationality: The Sociological Turn*. Dordrecht: Reidel

Brown JR. 1989. *The Rational and the Social*. London: Routledge

Callon M, Latour B. 1981. Unscrewing the big Leviathan: how actors macro-structure reality and how sociologists help them to do so. In *Advances in Social Theory and Methodology: Toward an Integration of Micro–and Macro-Sociologies*, ed. KD Knorr-Cetina, AV Cicourel, pp. 277–303. London: Routledge & Kegan Paul

Callon M, Latour B, eds. 1991. *La science telle qu'elle se fait*. Paris: Éditions La Découverte

Callon M, Law J, Rip A, eds. 1986. *Mapping the Dynamics of Science and Technology: Sociology of Science in the Real World*. London: Macmillan

Cambrosio A, Keating P. 1988. 'Going monoclonal': art, science, and magic in the day-to-day use of hybridoma technology. *Soc. Probl.* 35:244–60

Cambrosio A, Limoges C, Pronovost D. 1990. Representing biotechnology: an ethnography of Quebec science policy. *Soc. Stud. Sci.* 20: 195–227

Chambers D, Turnbull D. 1989. Science worlds: an integrated approach to social studies of science teaching. *Soc. Stud. Sci.* 19:155–79

Chubin D, Chu E, eds. 1989. *Science Off the Pedestal*. Belmont, CA: Wadsworth

Clarke AE. 1990. A social worlds research adventure: the case of reproductive science. See Cozzens & Gieryn 1990, pp. 15–42

Clarke AE, Fujimura JH, eds. 1992. *The Right Tools for the Job: At Work in Twentieth-Century Life Sciences*. Princeton, NJ: Princeton Univ. Press

Clarke AE, Montini T. 1993. The many faces of RU486: tales of situated knowledges and technological contestations. *Sci. Technol. Hum. Values* 18:42–78

Code L. 1991. *What Can She Know? Feminist Theory and the Construction of Knowledge*. Ithaca, NY: Cornell Univ. Press

Cole S. 1992. *Making Science: Between Nature and Society*. Cambridge, MA: Harvard Univ. Press

Collins HM. 1975. The seven sexes: a study in the sociology of a phenomenon, or the replication of an experiment in physics. *Sociology* 9:205–24

Collins HM. 1981a. Understanding science. *Fund. Sci.* 2:367–80

Collins HM. 1981b. What is TRASP? The radical programme as a methodological imperative. *Philos. Soc. Sci.* 11:215–24

Collins HM. 1981c. Son of seven sexes: the social destruction of a physical phenomenon. *Soc. Stud. Sci.* 11:33–62

Collins HM. 1983a. The sociology of scientific knowledge: studies of contemporary science. *Annu. Rev. Sociol.* 9:265–85

Collins HM. 1983b. The meaning of lies: accounts of action and participatory research. In *Accounts and Action*, ed. GN Gilbert, P Abell, pp. 69–76. Aldershot: Gower

Collins HM. 1985. The possibilities of science policy. *Soc. Stud. Sci.* 15:554–58

Collins HM. 1987. Pumps, rock and reality. *Sociol. Rev.* 35:819–28

Collins HM. 1990. *Artificial Experts: Social Knowledge and Intelligent Machines*. Cambridge, MA: MIT Press

Collins HM. 1991. Captives and victims: comment on Scott, Richards, and Martin. *Sci. Technol. Hum. Values* 16:249–51

Collins HM. [1985] 1992. *Changing Order: Replication and Induction in Scientific Practice*. Chicago: Univ. Chicago Press. 2nd ed.

Collins HM, Cox G. 1977. Relativity revisited: Mrs Keech—a suitable case for special treatment? *Soc. Stud. Sci.* 7: 372–80

Collins HM, Harrison RG. 1975. Building a TEA laser: the caprices of communication. *Soc. Stud. Sci.* 5:441–50

Collins HM, Pinch TJ. 1982. *Frames of Meaning: The Social Construction of Extraordinary Science* London: Routledge & Kegan Paul

Collins HM, Pinch TJ. 1993. *The Golem: What Everyone Should Know about Science*. Cambridge: Cambridge Univ. Press

Collins, HM, Yearley S. 1992. Epistemological chicken. See Pickering 1992, pp. 301–26

Coulter J. 1975. Perceptual accounts and interpretive asymmetries. *Sociology* 17:385–96

Cozzens S, Gieryn T, eds. 1990. *Theories of Science in Society*. Bloomington: Indiana Univ. Press

Dear P, ed. 1991. *The Literary Structure of Scientific Argument: Historical Studies*. Philadelphia, PA: Univ. Penn. Press

Dear P. 1995. *Discipline and Experience: The Mathematical Way in the Scientific Revolution*. Chicago: Univ. Chicago Press

Douglas M. 1986. The social preconditions of radical scepticism See Law 1986a, pp. 68–87

Durkheim E. [1899] 1972. *Selected Writings*. (Ed. and transl. A Giddens.) Cambridge: Cambridge Univ. Press

Epstein S. 1993. *Impure science: AIDS, activism, and the politics of knowledge*. PhD thesis. Univ. Calif., Berkeley

Feyerabend P. [1975] 1978. *Against Method: Outlines of an Anarchistic Theory of Knowledge*. London: Verso

Fuchs S. 1992. *The Professional Quest for Truth: A Social Theory of Knowledge and Science*. Albany: State Univ. New York Press

Fujimura J. 1987. Constructing 'do-able' problems in cancer research: articulating alignment. *Soc. Stud. Sci.* 17:257–93

Fujimura J. 1988. The molecular biological bandwagon in cancer research: where social worlds meet. *Soc. Probl.* 35:261–83

Fuller S. 1988. *Social Epistemology*. Bloomington: Indiana Univ. Press

Fuller S. 1992. Social epistemology and the research agenda of science studies. See Pickering 1992, pp. 390–428

Fuller S. 1993. A strategy for making science studies policy relevant. In *Controversial Science: From Content to Contention*, ed. T Brante, S Fuller, W Lynch, pp. 107–25. Albany: State Univ. New York Press

Giddens A. [1976] 1993. *New Rules of Sociological Method: A Positive Critique of Interpretative Sociologies*. Stanford, CA: Stanford Univ. Press. 2nd ed.

Gieryn T. 1992. The ballad of Pons and Fleischmann: experiment and narrative in the (un)making of cold fusion. In *The Social Dimensions of Science*, ed. E McMullin, pp. 217–43. Notre Dame, IN: Univ. Notre Dame Press

Gilbert GN, Mulkay M. 1984. *Opening Pandora's Box: A Sociological Analysis of Scientists' Discourse*. Cambridge: Cambridge Univ. Press

Golinski JV. 1990. The theory of practice and the practice of theory: sociological approaches in the history of science. *Isis* 81: 492–505

Golinski JV. 1994. Precision instruments and the demonstrative order of proof in Lavoisier's chemistry. *Osiris* 9:30–47

Gooding D. 1985. 'In nature's school': Faraday as an experimentalist. In *Faraday Rediscovered: Essays on the Life and Work of Michael Faraday, 1797–1867*, ed. D Gooding, FAJL James, pp. 106–35. London: Macmillan

Gross P, Levitt N. 1994. *Higher Superstition: The Academic Left and Its Quarrels with Science*. Baltimore: Johns Hopkins Univ. Press

Hagendijk R. 1994. Towards a sociology of science. *Soc. Stud. Sci.* 24:135–39

Haraway DJ. 1991. *Simians, Cyborgs, and Women: The Reinvention of Nature*. New York: Routledge

Harding S. 1986. *The Science Question in Feminism*. Ithaca, NY: Cornell Univ. Press

Jasanoff S. 1990. *The Fifth Branch: Science Advisers as Policymakers*. Cambridge, MA: Harvard Univ. Press

Jasanoff S. 1992. Science, politics, and the renegotiation of expertise at EPA. *Osiris* 7: 195–217

Jasanoff S, Markle G, Petersen J, Pinch T, eds. 1994. *Handbook of Science and Technology Studies*. Beverly Hills, CA: Sage

Jonsen A, Toulmin S. 1988. *The Abuse of Casuistry: A History of Moral Reasoning*. Berkeley: Univ. Calif. Press

Jordan K, Lynch M. 1992. The sociology of a genetic engineering technique: ritual and rationality in the performance of the 'plasmid prep.' See Clarke & Fujimura 1992, pp. 77–114

Keller EF. 1983. *A Feeling for the Organism: The Life and Work of Barbara McClintock*. New Haven, Conn.: Yale Univ. Press

Keller EF. 1986. *Reflections on Gender and Science*. New Haven: CT: Yale Univ. Press

Keller EF. 1988. Feminist perspectives on science studies. *Sci. Technol. Hum. Values* 13: 235–49

Knorr-Cetina KD. 1981a. *The Manufacture of Knowledge: An Essay on the Constructivist and Contextual Nature of Science*. Oxford: Pergamon

Knorr-Cetina KD. 1981b. Social or scientific method or what do we make of the distinction between the natural and social sciences? *Philos. Soc. Sci.* 11:335–59

Kohler RE. 1994. *Lords of the Fly: Drosophila Genetics and the Experimental Life*. Chicago: Univ. Chicago Press

Kuhn TS. [1962] 1970. *The Structure of Scientific Revolutions*. Chicago: Univ. Chicago Press. 2nd ed.

Kuhn TS. 1992. *The Trouble with the Historical Philosophy of Science*. Cambridge, MA: Dept. Hist. Sci., Harvard Univ.

Latour B. 1987. *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge, MA: Harvard Univ. Press

Latour B. 1988a. *The Pasteurization of France*. (Trans. A Sheridan, J Law.) Cambridge, MA: Harvard Univ. Press

Latour B. 1988b. The politics of explanation: an alternative. See Woolgar 1988b, pp. 155–76

Latour B. 1993. *We Have Never Been Modern*. (Trans. C Porter.) Cambridge, MA: Harvard Univ. Press

Latour B, Woolgar S. [1979] 1986. *Laboratory Life: The [Social] Construction of Scientific Facts*. Princeton, NJ: Princeton Univ. Press. 2nd ed.

Law J. 1974. Theories and methods in the sociology of science: an interpretative approach. *Soc. Sci. Inform.* 13:163–72

Law J. 1975. Is epistemology redundant? A sociological view. *Philos. Soc. Sci.* 5:317–37

Law J. 1984. How much of society can the sociologist digest at one sitting? The 'macro' and the 'micro' revisited for the case of fast food. *Stud. Symbol. Interact.* 5:171–96

Law J, ed. 1986a. *Power, Action and Belief: A New Sociology of Knowledge?, Sociol. Rev. Monogr., Vol. 32.* London: Routledge & Kegan Paul

Law J. 1986b. Editor's introduction: Power/knowledge and the dissolution of the sociology of knowledge. See Law 1986a, pp. 1–19

Law J. 1994. *Organizing Modernity.* Oxford: Blackwell

Law J, Lodge P. 1984. *Science for Social Scientists.* London: Macmillan

Lawrence CJ. 1985. Incommunicable knowledge: science, technology and the clinical art in Britain 1850–1914. *J. Contemp. Hist.* 20: 503–20

Livingston E. 1986. *The Ethnomethodological Foundations of Mathematics.* London: Routledge & Kegan Paul

Longino H. 1990. *Science as Social Knowledge: Values and Objectivity in Scientific Inquiry.* Princeton, NJ: Princeton Univ. Press

Lynch M. 1985. *Art and Artifact in Laboratory Science: A Study of Shop Work and Shop Talk in a Research Laboratory.* London: Routledge & Kegan Paul

Lynch M. 1988. Alfred Schutz and the sociology of science. In *Worldly Phenomenology: The Continuing Influence of Alfred Schutz on North American Human Science,* ed. L. Embree, pp. 71–100. Washington DC: Cent. Adv. Res. Phenomenol., and Univ. Press Am.

Lynch M. 1991a. Laboratory space and the technological complex: an investigation of topical contextures. *Sci. Context* 4:51–78

Lynch M. 1991b. Pictures of nothing? Visual construals in social theory. *Sociol. Theory* 9:1–21

Lynch M. 1992a. Extending Wittgenstein: the pivotal move from epistemology to the sociology of science. See Pickering 1992, 215–65

Lynch M. 1992b. Going full circle in the sociology of knowledge: comment on Lynch and Fuhrman. *Sci. Technol. Hum. Values* 17 228–33

Lynch M. 1993. *Scientific Practice and Ordinary Action: Ethnomethodological and Social Studies of Science.* Cambridge: Cambridge Univ. Press

Lynch WT, Fuhrman ER 1991. Recovering and expanding the normative: Marx and the new sociology of scientific knowledge. *Sci. Technol. Hum. Values* 16:233–48

MacKenzie D. 1978. Statistical theory and social interests: a case study. *Soc. Stud Sci.* 8:35–83

MacKenzie D. 1981a. *Statistics in Britain, 1865–1930: The Social Construction of Scientific Knowledge.* Edinburgh: Edinburgh Univ. Press

MacKenzie D. 1981b. Interests, positivism and history. *Soc. Stud. Sci.* 11:498–504

Martin B. 1993. The critique of science becomes academic. *Sci. Technol. Hum. Values* 18:247–59

McHugh P. 1970. On the failure of positivism. In *Understanding Everyday Life: Toward the Reconstruction of Sociological Knowledge,* ed. JD Douglas, pp. 320–35. Chicago: Aldine

Merchant C. 1980. *The Death of Nature: Women, Ecology, and the Scientific Revolution.* New York: Harper & Row

Merton RK. [1938] 1970. *Science, Technology, and Society in Seventeenth-Century England.* New York: Harper & Row. 2nd ed.

Merton RK. [1945] 1973. Paradigm for the sociology of knowledge. In *The Sociology of Science: Theoretical and Empirical Investigations,* ed. NW Storer, pp. 7–40. Chicago: Univ. Chicago Press

Morton O, Carr G, eds. 1993. *Tests of the Truth: The Experiment in Modern Science.* London: The Economist

Morus I. 1988. The sociology of sparks: an episode in the history and meaning of electricity. *Soc. Stud. Sci.* 18:387–417

Mukerji C. 1989. *A Fragile Power: Scientists and the State.* Princeton, NJ: Princeton Univ. Press

Mulkay M. 1979. *Science and the Sociology of Knowledge.* London: George Allen & Unwin

Mulkay M. 1991. *Sociology of Science: A Sociological Pilgrimage.* Milton Keynes: Open Univ. Press/Bloomington: Indiana Univ. Press

Mulkay M, Potter J, Yearley S. 1983. Why an analysis of scientific discourse is needed. In *Science Observed: Perspectives on the Social Study of Science,* ed. KD Knorr-Cetina, M Mulkay, pp. 171–203. London: Sage

Myers G. 1990. *Writing Biology: Texts in the Social Construction of Scientific Knowledge.* Madison: Univ. Wisc. Press

Noble D. 1992. *A World Without Women: The Christian Clerical Culture of Western Science.* New York: Knopf

O'Connell J. 1993. Metrology: the creation of universality by the circulation of particulars. *Soc. Stud. Sci.* 23:129–73

Ophir A, Shapin S. 1991. The place of knowledge: a methodological survey. *Sci. Context* 4:3–21

Parsons T. [1937] 1949. *The Structure of Social Action.* New York: Free Press. 2nd ed.

Pickering A, ed. 1992. *Science as Practice and Culture.* Chicago: Univ. Chicago Press

Pickering A 1993a. The mangle of practice: agency and emergence in the sociology of science *Am J. Sociol* 99:559–89

Pickering A. 1993b. Anti-discipline or narratives of illusion. In *Knowledges: Historical and Critical Studies in Disciplinarity*, ed. E Messer-Davidow, D Shumway, D Sylvan, pp. 103–22. Charlottesville: Univ. Virginia Press

Pinch TJ. 1985. Towards an analysis of scientific observation: the externality and evidential significance of observational reports in physics. *Soc. Stud. Sci.* 15:3–36

Pinch TJ. 1993. Turn, turn, and turn again: the Woolgar formula. *Sci. Technol. Hum Values* 18:511–22

Pinch TJ, Pinch TJ. 1988. Reservations about reflexivity and new literary forms or why let the devil have all the good tunes. See Woolgar 1988b, pp. 178–97

Polanyi M. 1958. *Personal Knowledge: Towards a Post-Critical Philosophy*. Chicago: Univ. Chicago Press

Pollner M. 1987. *Mundane Reason: Reality in Everyday and Sociological Discourse*. Cambridge: Cambridge Univ. Press

Restivo S. 1989. Critical sociology of science. See Chubin & Chu 1989, pp. 57–70

Richards E, Schuster J. 1989. The feminine method as myth and accounting resource· a challenge to gender studies and the social studies of science. *Soc. Stud. Sci.* 19:697–720

Roberts L. 1991. A word and the world: the significance of naming the calorimeter. *Isis* 82:198–222

Rouse J. 1987. *Knowledge and Power: Toward a Political Philosophy of Power*. Ithaca, NY: Cornell Univ. Press

Rudwick MJS. 1985. *The Great Devonian Controversy: The Shaping of Scientific Knowledge among Gentlemanly Specialists*. Chicago: Univ. Chicago Press

Sacks H. 1984. On doing 'being ordinary.' In *Structures of Social Action: Studies in Conversation Analysis*, ed. JM Atkinson, J Heritage, pp. 413–29. Cambridge: Cambridge Univ. Press

Schaffer S. 1988. Astronomers mark time: discipline and the personal equation. *Sci. Context* 2:115–45

Schaffer S. 1989. Glass works: Newton's prisms and the uses of experiment. In *The Uses of Experiment: Studies in the Natural Sciences*, ed. D Gooding, TJ Pinch, S Schaffer, pp. 67–104. Cambridge: Cambridge Univ. Press

Schaffer S. 1992a. Self-evidence. *Crit. Inquiry* 18:327–62

Schaffer S. 1992b. Late Victorian metrology and its instrumentation: a manufactory of ohms. In *Invisible Connections: Instruments, Institutions, and Science*, ed. R Bud, S Cozzens, pp. 23–56. Bellingham, Wash.: SPIE Optical Engin.

Schiebinger L. 1989. *The Mind Has No Sex? Women in the Origins of Modern Science*. Cambridge, MA: Harvard Univ. Press

Scott P, Richards E, Martin B. 1990. Captives of controversy: the myth of the neutral social researcher in contemporary scientific controversies. *Sci. Technol. Hum. Values* 15:474–94

Shapin S. 1979. The politics of observation: cerebral anatomy and social interests in the Edinburgh phrenology disputes. In *On the Margins of Science: The Social Construction of Rejected Knowledge*, ed. R Wallis, pp. 139–78. Keele: Keele Univ. Press

Shapin S. 1982. History of science and its sociological reconstructions. *Hist. Sci.* 20:157–211

Shapin S. 1984a. Pump and circumstance: Robert Boyle's literary technology. *Soc. Stud. Sci.* 14:481–520

Shapin S. 1984b. Talking history: reflections on discourse analysis. *Isis* 75:125–30

Shapin S 1988. The house of experiment in seventeenth-century England. *Isis* 79:373–404

Shapin S. 1991a. "The mind is its own place": science and solitude in seventeenth-century England. *Sci. Context* 4:191–218

Shapin S. 1991b. "A scholar and a gentleman": the problematic identity of the scientific practitioner in early modern England. *Hist. Sci.* 29:279–327

Shapin S. 1992. Discipline and bounding: the history and sociology of science as seen through the externalism–internalism debate. *Hist. Sci.* 30:333–69

Shapin S. 1994. *A Social History of Truth: Civility and Science in Seventeenth-Century England*. Chicago: Univ. Chicago Press

Shapin S, Schaffer S. 1985. *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*. Princeton, NJ: Princeton Univ. Press

Simmel G 1950. The lie. In *The Sociology of Georg Simmel*, ed. and trans. KH Wolff, pp. 312–16. New York: Free Press

Smith D. 1990. *The Conceptual Practices of Power: A Feminist Sociology of Knowledge*. Boston: Northeastern Univ. Press

Star SL. 1989. *Regions of the Mind: Brain Research and the Quest for Scientific Certainty*. Stanford, CA: Stanford Univ. Press

Star SL, Griesemer JR. 1989. "Translations" and boundary objects: amateurs and professionals in Berkeley's Museum of Vertebrate Zoology, 1907–39. *Soc. Stud. Sci.* 19:387–420

Theocharis T, Psimipoulis M. 1987. Where science has gone wrong. *Nature* 329:595–98

Toulmin S. 1990. *Cosmopolis: The Hidden Agenda of Modernity*. New York: Free Press

Travis GDL, Collins HM. 1991. New light on old boys: cognitive and institutional particularism in the peer review system. *Sci. Technol. Hum. Values* 16:322–41

Turner SP. 1981. Interpretive charity, Durkheim, and the "strong programme" in the sociology of science. *Philos. Soc. Sci.* 11: 231–43

Turner SP. 1989. Truth and decision. See Chubin & Chu 1989, pp. 175–88

Van Helden A. 1994. Telescopes and authority from Galileo to Cassini. *Osiris* 9:8–29

Warwick A. 1992–1993. Cambridge mathematics and Cavendish physics: Cunningham, Campbell and Einstein's relativity 1905–1911. *Stud. Hist. Philos. Sci.* 23:625–56; 24:1–25

Winch P. 1958. *The Idea of a Social Science and Its Relation to Philosophy*. London: Routledge & Kegan Paul

Wolpert L. 1992. *The Unnatural Nature of Science: Why Science Does Not Make (Common) Sense*. London: Faber & Faber

Woolgar S. 1976. Writing an intellectual history of discovery accounts. *Soc. Stud. Sci.* 6.395–422

Woolgar S. 1981. Interests and explanation in the social study of science. *Soc. Stud. Sci.* 11:365–94

Woolgar S. 1988a. *Science: The Very Idea*. Chichester: Ellis Horwood/London & New York: Tavistock

Woolgar S, ed. 1988b. *Knowledge and Reflexivity: New Frontiers in the Sociology of Knowledge*. London: Sage

Woolgar S. 1989. What is the analysis of scientific rhetoric for? A comment on the possible convergence between rhetorical analysis and social studies of science. *Sci. Technol. Hum. Values* 14:47–49

Wynne B. 1992. Carving out science (and politics) in the regulatory jungle. *Soc. Stud. Sci.* 22:745–58

Yearley S. 1981. Textual persuasion: the role of social accounting in the construction of scientific arguments. *Philos. Soc. Sci.* 11: 409–35

Yearley S. 1982. The relationship between epistemological and sociological cognitive interests: some ambiguities underlying the use of interest theory in the study of scientific knowledge. *Stud. Hist. Philos. Sci.* 13:353–88

Yearley S. 1984. *Science and Sociological Practice*. Milton Keynes: Open Univ. Press

Zuckerman H. 1988. The sociology of science. In *Handbook of Sociology*, ed. N Smelser, pp. 511–74. Newbury Park, CA: Sage

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INSTITUTIONAL ARRANGEMENTS AND STRATIFICATION PROCESSES IN INDUSTRIAL SOCIETIES

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ABSTRACT

This chapter reviews the current state of our knowledge about the role of institutional arrangements in stratification processes in industrial societies. The particular institutional arrangements considered are those of educational and labor force organizations. The review is organized around the Blau-Duncan basic model of status attainment and points to the need for a more elaborated conceptualization. Institutional arrangements structure the connections between social origin and educational attainment, between educational attainment and early labor force placements, and between early and later placements in the labor force. Industrial societies vary widely in the nature of these institutional arrangements, and that variation affects the patterns of movement from origins to destinations in the stratification system. Features of educational institutions considered include separation of students into specialized schools and ability groups (tracking), degree of central control, degree of autonomy, degree of stratification, and the number and specialized nature of credentials. Features of labor force institutions considered include occupational and firm-specific job classifications, internal labor markets and vacancy chains, industrial sectors and career lines. Critical aspects of the societal variation are the

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form of the interface between education and labor force structures and the nature of the transition from school to work. A preliminary set of hypotheses linking institutional arrangements and stratification processes is derived from this review.

INTRODUCTION

In their review of *Comparative Intergenerational Stratification Research*, Ganzeboom et al (1991) refer to "three generations" of stratification research. During the first generation, research was concerned with comparing tables that cross-classified categories of the occupational positions of fathers and sons as these tables varied across societies and over time. The second generation began with the introduction of Blau & Duncan's (1967) basic model of status attainment. It shifted the focus from father-son comparisons to stages in a process by which the sons are distributed in a continuous status hierarchy, given the fathers' positions in that same status hierarchy. The third, most recent, generation of comparative stratification research has returned to a focus on tables of occupational or social class categories for parent and child generations, now made more sophisticated by theoretical developments, new analytic methods, and much better data.

This chapter can be seen as conceptually grounded in the second generation of research because it is organized around the Blau-Duncan model and it uses a life-course perspective to organize the materials. The works cited here can also be viewed as the beginning of a fourth generation of stratification research, one in which the roles of institutional arrangements in the shaping of stratification processes are systematically taken into account. The purpose of the second generation was to seek an understanding of stratification processes, and it provided an overall framework for doing that. The more recent contributions to this effort have expanded our knowledge of the institutional arrangements that shape those processes and, in so doing, have shown the limitations of the earlier work.

Our growing knowledge of the role of institutional arrangements in shaping stratification processes suggests two kinds of modifications of the status attainment approach to modeling social stratification processes. One of these is to conceptualize intergenerational mobility as a series of moves through structural locations in social organizations (e.g. schools, firms). The other is to view these structural locations both as hierarchically ranked and as providing varied opportunities for later moves and access to various kinds and levels of attainment. My purpose is to highlight the importance of socially provided channels of attainment and to link them to the observed patterns of social stratification in industrial societies.[1]

Joel Spring (1976) has referred to the educational system as "the sorting machine" for society because its students move into adult labor force positions whose stratified levels are highly correlated with levels of educational attainment. I use the "sorting machine" metaphor throughout this chapter in a broader sense, to refer to both educational and labor force mechanisms that serve to channel individuals toward adult positions in the stratification system. The metaphor helps to keep salient two features of the stratification processes I want to emphasize. One is the set of structural locations provided by societies throughout the life course, locations whose hierarchical order is the substance of what we mean by the word "stratified." I also want to emphasize the active role played by institutions in "sorting" individuals into these stratified locations. We cannot ignore the role of individuals' choices and actions, but my purpose is to show how the institutional arrangements provide the alternatives and delimit those choices and actions.

The Blau-Duncan model represented the stratification process as consisting of three stages. The first stage linked social origin with educational attainment. The second stage linked educational attainment and origin with the status of first job. The third stage linked the social status of first job, educational attainment, and social origin with the status of a later job. Early elaborations of the Blau-Duncan model, best reflected in "the Wisconsin model" (Sewell et al 1969), used social psychological variables (ability, ambition, significant others' influence) to help explain the positive association between social origin and educational attainment.

The adequacy of the status attainment models was soon questioned because they seemed implicitly to assume a wholly "open" society in which individuals were able to compete for desired outcomes (Horan 1978), they ignored allocation processes (Kerckhoff 1976), and they did not consider a whole range of structural features of the society that limited some individuals' opportunities (Beck et al 1978, McClendon 1976, Porter 1974).

At the same time these critiques were being put forth, two relatively independent sets of developments made some of the institutional arrangements related to social stratification processes more salient. Within educational settings, internal organizational features such as ability groups and curricular tracks were shown to affect individual achievements even when a wide range of background factors were taken into account (Alexander et al 1978, Heyns 1974). In the labor force, variations in individual achievements were being reported between broad industrial sectors (Beck et al 1978), among firms of different sizes (Stolzenberg 1978), and according to the internal organization of firms (Baron & Bielby 1980). This was the beginning of the recognition of the critical role played by institutional arrangements in shaping stratification processes in industrial societies.

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[1] To restrict the discussion to a focus on institutional arrangements is not to minimize the importance of either the social psychological processes involved or the differential treatment of subgroups in producing the observed patterns of social stratification. It is simply to facilitate presenting a coherent discussion within the necessary space limitations. Other factors deserve full treatment on their own, and some of them have been the subject of informative reviews (e.g. Allen & Farley 1986, Foner 1979, Reskin 1993, Spenner 1988) Actually, this review is even more narrowly focused than it might be: It deals with only limited aspects of education and labor force structures. For a broader view of labor force structures, see Kalleberg (1988).

This review brings together a number of the more recent of these contributions to suggest that 1) we know a great deal about the role of institutional arrangements in the process of stratification, 2) these arrangements vary considerably across industrial societies, and 3) the intersocietal variation provides a basis for organizing our knowledge of stratification processes.

The review indicates that the status attainment model is limited in at least three related ways. Its most basic limitation is its failure to take into account the structural locations in the social organizations that constitute the society's sorting machine. Once we recognize the importance of those structural locations, however, it becomes apparent that the three-stage form of the model is an oversimplification of the steps involved in moving from an origin to an adult destination in the stratification system.[2] And, finally, careful attention to the available structural locations and the flow of individuals through them shows considerable variation in the "orderliness" of individual career pathways. A status attainment model based on regression coefficients representing the linkages between levels of attainment at four career points cannot capture these features of the stratification process.

The Blau-Duncan basic model is explicitly structured to map a sequence of life-course stages: years of preparation in the family and at school, entry into the adult world of work, and adult experiences in the labor force. To understand intergenerational continuity and mobility, we must recognize that the structural locations in the social organizations involved in those three stages are differentially linked with each other and that those linked locations have cumulative effects on the stratification process.

Each of the following sections deals with the institutional arrangements relevant to one of the major paths in the Blau-Duncan model. The first section considers the connection between social origin and educational attainment. The second section deals with the relationship between educational attainment and the characteristics of the first job. The third section is concerned with work-career mobility—changes in occupational position between labor force entry and middle age. Each section points to the need to recognize multiple steps in what the status attainment model treats as a single stage. Each section also identifies multiple career trajectories that cannot be fully represented by single path coefficients. Throughout, intersocietal variations in the general patterns are used to help clarify the role of institutional arrangements in organizing stratification processes.

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[2] Stratification levels are defined in terms of strata of occupational positions. In most of the literature cited, the hierarchy of occupational positions is defined in terms of the status or prestige of the occupations. However, there continues to be a difference of opinion about whether the important distinctions among occupations are those of status or prestige or, rather, differences of class. Some of the cited literature, especially studies of European stratification processes, use class categories. I use the term *occupational status* throughout for simplicity.

SOCIAL ORIGIN AND EDUCATIONAL ATTAINMENT

A major function of all school systems in industrial societies is to "grade" their students—distribute them into a stratified hierarchy. Although some analysts view schools as offering an "open" opportunity structure, the opportunity is, at best, the chance to compete in a contest where only some can be wholly successful. As Sorokin (1927:190) put it: "The school, even the most democratic school, open to everybody, if it performs its task properly, is the machinery of the 'aristocratization' and stratification of society, not of 'leveling' and 'democratization.'"

The sorting process in schools reflects the first path in the Blau-Duncan model, a path that shows a significant effect of social origin on educational attainment. In no society are the successful ones a random sample of the student population. We consistently find a positive association between the social status of a child's family and his or her level of educational attainment. That association is found both across societies and across time. Most industrial societies have introduced some form of educational reform during the twentieth century that has had as one of its goals the loosening of the origin–educational attainment association, but with minor exceptions, the association between social origin and advancement through educational levels has remained essentially the same (Shavit & Blossfeld 1993).

How can we explain that persistent association? Bidwell & Friedkin (1988) suggest three possibilities: 1) There may be personal traits that are associated with social origins and that affect educational attainment. 2) Students from different origin levels may have more or less access to educational resources that facilitate attainment. 3) The formal and informal organization of schools may favor high status students. There is evidence that all three of these help to explain the origin–educational attainment association, but access to educational resources and the organization of the schools are more directly relevant to the present discussion.

The socioeconomic levels of children's families have a strong effect on their school experiences. The schools they attend differ widely in the kinds of educational resources they provide. Especially in secondary school, there is an association between family social status and student access to favored educational locations—better schools, more academically challenging courses, and classes taught by the "better" teachers (Borman & Spring 1984, Jencks et al 1972, Kozol 1991, Oakes et al 1992).

Educational resources can come directly from families or indirectly due to family influences on the schools. Coleman (1988) has suggested that the impact of family background on young people's lives can be thought of as the result of three kinds of family resources: human capital, financial capital, and social capital. Human capital includes both inherited ability and the qualities of one's parents. Financial capital makes it possible for students to have access to enriching experiences in the home, in school, and in the larger community.

Social capital may be as important as human capital and financial capital during elementary and secondary school. Both the quantity and effectiveness of parent contact with school personnel increases with the level of family social status (Lareau 1989). Even modest parental involvement can have long-term effects, and those long-term effects can flow from the structured nature of school programs. For instance, parental influence on children's mathematics course placement in seventh grade, which is greater the higher the parents' educational level, can provide the basis for taking advanced mathematics in high school which, in turn, can facilitate access to higher education (Useem 1992). Schools provide channels of opportunity, and families can influence children's entry into and progress through those channels.

It is common for schools to formalize channels of opportunity by organizing students into instructional groups based on "ability." Under some circumstances, this practice may lead to an overall increase in the average level of student performance (Slavin 1987, 1990), but most research shows that it serves to increase the variation in student performance without appreciably altering the average. Students in high ability groups gain more than those in low ability groups (Barr & Dreeben 1983, Gamoran 1986, 1987), and the two groups of students tend to be farther apart in achievement at the end of a period of separation than when it began.

Students are often repeatedly grouped, and there is an increased probability that a student who was in a high (or low) group one year will be in a high (or low) group the next year (Hallinan 1992). Grouping thus undoubtedly has a cumulative effect on student performance leading to increasing differences between those who have repeatedly been in high and low groups (Kerckhoff 1993). This is one of the ways in which educational careers can be said to be "orderly" or predictable. To the extent that placements in these organizational units are partially influenced by the social statuses of students' families, instructional grouping contributes to continuity of educational attainment across generations.

The Origin–Educational Attainment Association in Comparative Perspective

Most of the detailed research on these issues has been carried out in the United States. There are fewer in-depth studies of family-school relationships in other industrial societies. However, students from high status families are widely observed to be in the more advantageous school settings. In addition to schools with varying resources and channels of opportunities within schools, the advantageous settings are often types of schools—the British grammar school, French *lycee*, German *Gymnasium*, etc—but similar social status patterns are found in all of them. Associations between social origin and school locations are reported for many countries, including Great Britain (Ball 1981, Keddie 1971, Kerckhoff 1993), Ireland (Raftery & Hout 1985), France (Garnier 1982), Israel (Shavit & Featherman 1988, Yogev 1981), Hungary, and the Netherlands (Kolosi 1988, Peshar & Popping 1986). To my knowledge, there is less systematic information available about the processes by which these associations are produced in other countries than there is in the United States, but the resulting distributions by status are very similar.

All industrial societies exhibit a significant association between social origin and educational attainment, but they also show a pattern of decreasing selectivity by social status as students pass through the levels of the school system. The greatest social status differential in advancement occurs at the lower levels, and by the postsecondary level, social status differentials either disappear or are much reduced in magnitude (Müller & Karle 1992, Shavit & Blossfeld 1993). Thus, although the "sorting machine" clearly favors students from higher status families, those from lower status families who survive the early sorting regimes are increasingly able to continue toward higher attainment levels.

The proportion of students who are sorted out at lower levels varies greatly across societies, however. For instance, in the 1970s the proportion of students in France who completed secondary school was less than half that in either Germany or Great Britain. Yet, much more similar proportions obtained a university degree in all three countries (Müller & Karle 1992). These differences in "survival" rates might be expected to affect the social status distributions of the students at the higher levels because those from lower status families are filtered out at a greater rate at the lower levels in some societies than in others. If that is the case, it seems reasonable to expect a stronger association between social origin and educational attainment in societies that advance smaller proportions to higher educational levels.

However, Raftery & Hout (1993) suggest that, as changes in education supply and demand occur in a given society, these filters are adjusted in order to achieve "maximally maintained inequality" (as defined by that society). Their suggestion is consistent with the common observation that changes in educational systems do not seem to affect the pattern of greater early filtering out of students from low status origins (Shavit & Blossfeld 1993). However, it is not clear whether observations of "maximally maintained inequality" within a given society undergoing change are adequate to permit predictions of comparative mobility rates between societies with different filter rates.

One reason for the wide variation in the quality of American schools is the fact that our educational system is locally controlled and funded. Most other industrial societies have educational systems that are more centrally controlled than ours. The organization of the schools, the nature of the curriculum, and the pace of instruction are all more uniform in most other societies. Stevenson & Baker (1991) show that central control leads to greater uniformity of instruction. Thus, there is a much greater chance of between-school variation in learning opportunities in countries like the United States that have highly decentralized educational systems than there is in countries like France that have highly centralized systems.

These societal differences have led many to view the American educational system as ideally suited to facilitating social mobility. A much larger proportion of any cohort completes secondary school in the United States than in other industrial societies, and many more obtain university degrees. If, as suggested previously, early filtering works to the disadvantage of low status students, this would lead us to expect more social mobility in the United States than in most other industrial societies. There are two other structural features of the American educational system, however, that may increase the influence of social origin on educational attainment and thus reduce fluidity. The two features are the schools' exposure to community influence and the kinds of credentials they award.

Both centralization of control of the school system and the degree of autonomy of education officials appear to be lower in the United States than in other industrialized societies.[3] American schools seem to be more fully exposed to "client power" (Bidwell & Quiroz 1991), and that exposure provides greater opportunity for high status families to influence students' opportunities for learning and educational attainment, which should strengthen the origin–educational attainment association.

American schools also award fewer and less differentiated credentials than those in other industrial societies. At both the secondary and postsecondary levels, most other societies offer a set of differentiated credentials that are nationally recognized and, in most cases, are more clearly linked to labor force opportunities. The all-purpose American high school diploma and the lack of a national system of non-college postsecondary credentials leave most young Americans with few nationally recognized marketable credentials as they enter the labor force.

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[3] This is not to say that parents in other countries do not try to influence their children's educational opportunities. They do (Oswald et al 1988), but their ability to do so is more limited than in the United States.

The combination of these two features of the American system means that the sorting process is more exposed to direct family influence during elementary and secondary school, and the system provides fewer significant credentials for those who are not high achievers in the fully academic programs. Instead of sorting students into highly differentiated categories, the American system generally recognizes only four categories: high school dropouts, high school graduates, college dropouts (some college), and college graduates.[4] How students are ultimately sorted into the occupational hierarchy is thus highly dependent on influences outside educational institutions, and the sorting may not be based on criteria as universalistic as those used in the schools.

In summary, then, all industrialized societies use organizational mechanisms to sort students into hierarchically arranged categories, but these mechanisms vary considerably, both in their nature and in their timing. Most European educational systems are more centrally controlled than ours and thus are more uniform in organization and resources. Most European systems also have specialized secondary schools whose curricula are differentiated according to the assumed future labor force locations of their students. Fewer students go to university, but more obtain nationally recognized educational credentials that have occupational relevance.

These differences can be used to derive contradictory expectations regarding the degree of social mobility among industrial societies. On the one hand, they suggest that there should be more social mobility in the United States than in Europe because of the early selection into kinds of educational channels and the closer education-occupation linkage in Europe. On the other hand, the extended period of "open" access and local control in the American education system offers greater opportunities for family influence on students' educational opportunities, and that could reduce social mobility in the general population.

The only attempt to use a status attainment modeling approach to compare societies in this way (Treiman & Yip 1989) reports very little variation in the origin–educational attainment association in industrial societies.[5] More in-depth analysis than Treiman & Yip could conduct will be required to determine whether this means that neither of the above expectations is well-founded, that the two implied processes cancel each other, or something else.

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[4] We might add a fifth category, those with advanced degrees. About 10% of recent cohorts have obtained credentials higher than the bachelor's degree

Other kinds of variation can be predicted from these differences in the societies' educational sorting machines—that is, variation not represented in the status attainment model. Because most European education systems provide for early separation of students into categories that have some occupational relevance, clearer (more "orderly") educational career lines should be visible in Europe than in the United States. For instance, one might expect that British students' areas of secondary school examinations (CSEs, O-Levels, A-Levels) would be linked systematically with their postsecondary credentials. There is nothing wholly comparable to that kind of linkage in the American educational system, although there may be weak associations between high school track and kinds or levels of postsecondary course work.

These kinds of societal differences cannot be captured in the usual status attainment model because they represent institutional mechanisms by which the ultimate levels of educational attainment are generated. They point up the importance of educational careers bridging several stages of schooling and the degree to which societies do or do not provide clearly defined educational career lines. There are similar limitations of the status attainment model's representation of the transition from school to work and the career in the labor force, as the next two sections indicate.

THE TRANSITION FROM SCHOOL TO WORK

The Blau-Duncan basic model of status attainment represented educational attainment as wholly prior to first job, and much of the social stratification literature continues to do the same. Both Blau & Duncan (1967, pp. 166–68) and many subsequent analysts (e.g. Featherman & Hauser 1978) have recognized the flaws in that representation, but few attempts have been made to deal with them systematically. The problem is that some individuals increase their educational attainments after they enter the labor force. Blau & Duncan estimated that as many as one eighth of their sample may have done that. For them, "first job" preceded ultimate educational attainment.

In one of the few analyses of this overlap between schooling and work in the United States, Coleman (1984) shows that a major part of the occupational mobility of a sample of American men born between 1930 and 1939 was due to multiple entries into the labor force, between which many of them attended school. The gains through exits and reentries were greater for white than for black men, but they were substantial for both. It is clear from this analysis that the education–first job association would look very different depending on which first job is counted and, therefore, which measure of educational attainment is used.

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[5] Treiman & Yip acknowledge the difficulty of devising an appropriate common measure of educational attainment across the 21 societies they studied, and they necessarily adopted years of schooling as the most reasonable one. Their results suggest the limitations of that measure, especially in Great Britain and societies historically linked with Great Britain (e.g. Australia, Ireland). A great deal of additional work will be required to devise a more suitable measure that reflects the special features of the various systems.

The School-to-Work Transition in Comparative Perspective

The problematic nature of the ordering of first job and educational attainment is even clearer in many other societies than it is in the United States. For example, many German and Austrian youth take part in a combination of schooling and work for several years after leaving full-time school, through apprenticeships or other systematic work-and-study programs (Allmendinger 1989, Haller et al 1985). Large proportions of British workers also add to their educational credentials after entering the labor force (Kerckhoff 1990).

This overlap between schooling and work presents basic definitional problems for those doing comparative research. Some analysts have chosen to define the "first job" as that job entered after the last exit from any kind of school. While that definition helps to simplify the analysis, it also obscures important societal differences in the school-to-work transition. Allmendinger (1989) chooses that definition, but she also includes in her analysis an accounting of jobs held during what she calls the "transition period," prior to what she calls the "career start." Although the "transition period" is an especially important one in Germany, it actually exists in varying forms and over varying periods of time in all industrial societies. It is that period between full-time schooling before labor force entry and full-time work with no future return to school.

There are two ways in which workers may increase their educational attainment after entering the labor force. In the Coleman (1984) analysis only one of these is taken into account, exit from the labor force followed by entry into some form of (usually) full-time schooling. However, it is also possible to increase one's educational credentials through part-time schooling while still employed full-time. In my British analysis (Kerckhoff 1993), although the cohort could be followed only until they were 23 years old, one third of the men and one sixth of the women had already increased their educational credentials after entering the labor force full-time. The great majority of both sexes who increased their attainments did so through part-time schooling, much of it sponsored by their employers. Those from the more academic secondary schools (grammar and private schools) were more likely than the others (from comprehensive and secondary modern schools) to gain through a return to full-time rather than part-time schooling, but the total proportions who gained did not differ greatly according to the kind of secondary school they attended.

The way the analyst treats this combination of work and school will affect the research results. In my British analysis, I treated as a "first job" the first full-time job held for at least a month (but not during vacations). In many cases, respondents were simultaneously working full-time and taking some kind of course. I therefore have referred to educational gains after entering the first job. In contrast, Allmendinger (1989) treats any such combined activities as part of the "transition period" and the "first job" that begins the work career is one that is not combined with or followed by any educational activity. Very few Germans return to school after leaving, and thus few increase their educational credentials after entering the first job as she defines it. Neither of these approaches is ideal, but they lead to very different definitions of educational gains after the first job as well as to very different definitions of work-career mobility.

The frequent combination of work and schooling in other societies makes it clear that educational and occupational attainment processes often occur simultaneously, and they can influence each other. In my British analysis, the higher the prestige of the first full-time job, the greater the gain in educational attainment, and the greater the gain in educational attainment after full-time labor force entry, the greater the gain in occupational prestige.

The amount of change in educational attainment after initial labor force entry evidently varies greatly across societies, although the available data do not make it possible to conduct extensive comparative analyses. An added complication in making such comparisons results from the different societies' methods of measuring educational attainment. The American tendency to pay attention only to high school and college diplomas or, at most, years of regular academic schooling means that it is much less likely that Americans will be shown to have increased their educational attainments while employed full-time, even though many of them take postsecondary vocational courses. On the other hand, it is very common for German and British workers to increase their nationally recognized educational credentials while fully employed.

The various educational and labor force institutional arrangements found in industrial societies are related to each other. There is a general tendency for societies in which smaller proportions obtain a university degree to provide mechanisms by which those who do not go on in higher education can obtain valuable educational credentials after they leave full-time school. The average labor force career thus starts earlier than in the United States, but it is likely to combine work and schooling. The availability of a more differentiated set of educational credentials also means that there is a clearer association between those credentials and particular occupational placements than there is between a high school or college degree and positions in the American labor force.

Maurice et al (1986) refer to the educational system's "capacity to structure" the flow of young people into the labor force. Beginning in secondary school and continuing in the postsecondary period, the German educational system sorts students into highly differentiated categories identified by an elaborate set of occupationally relevant educational credentials. Although much of the postsecondary schooling is associated with a worker's employment, it provides the basis for passing national examinations that certify the worker's skills and that facilitate his or her later job placement, even in another firm.

The French secondary schools use a less refined sorting system; they provide many fewer and less differentiated educational credentials. And although much of the French postsecondary schooling is also associated with employment, it less often provides the basis for nationally recognized credentials a worker can use in employment elsewhere. In this sense, the American system of credentials is closer to the French than to the German. The British secondary and postsecondary credentials are similar to those in Germany in being part of a nationally recognized system of "qualifications," but they are not as tightly linked to kinds of jobs. They are also less heavily dependent on employer influence than are those in Germany, although many are obtained with employer assistance.

These differences in the educational systems' capacity to structure the distribution of students into the labor force are also associated with differences in the methods of entering first jobs. Most of the American studies of the transition from school to work focus on the job search process of non-college educated students. The role of friends, relatives, and acquaintances in providing suggestions and information is especially emphasized (Corcoran et al 1980, Granovetter 1974, 1986, Ornstein 1976). There may be a joint dependence of the nature of the job search and the employer's recruiting methods (Marsden & Campbell 1990), but there is little systematic knowledge about it.

The American educational system is relatively uninvolved in students' entry into the labor force, especially during or at the end of secondary school. Because many more students enter the labor force before the age of 18 in most other industrial societies, there is usually a closer relationship between secondary schools and prospective employers. The most extreme case, perhaps, is Japan. Many Japanese high schools provide employers with lists of nominees for the jobs employers say they need to fill, and those recommendations are usually accepted (Rosenbaum et al 1990, Ishida 1993). There develops a relatively stable relationship between an employer and a school that encourages both organizations to respect the needs and wishes of the other and to act responsibly in their negotiations.

The nature of the education–first job linkage is thus a major source of variation in the stratification processes in industrialized societies. Although there are opportunities for increasing educational attainment after labor force entry in all industrial societies (a period of transition), both the nature and the availability of those opportunities differ greatly. The proportions of an age cohort that obtain additional nationally recognized credentials after entering their first job are larger in most European countries than in the United States. Although employer-provided schooling is common in most European countries, the degree to which it leads to nationally recognized credentials that can help in later job searches varies. And the institutional linkages between schools and work places are much closer in Japan and Germany than in most other countries.

Although all industrialized societies use their school systems to sort students into differentiated categories, both the degree of differentiation of the education categories and their degree of "fit" with labor force categories vary greatly. The transition from school to work cannot be captured by a model that defines it as a single step in the status attainment process. In almost all industrial societies, there is a life-course period (of varying length) during which both education and labor force sorting processes occur. The interplay between those two kinds of processes is undoubtedly complex in all societies, but it is especially so in those European societies in which the institutional arrangements specifically provide for it.

These differences also make the last stage of the status attainment model a less-than-uniform one across societies. That stage, from first job to a later job, or the career in the labor force, is not the same thing in all industrial societies, however we define "first job." We are always left with the awkward transition period that involves a mixture of educational and labor force processes, although the mixture varies greatly across industrial societies.

CAREERS IN THE LABOR FORCE

A series of publications in the 1970s emphasized the importance of structural factors in the patterns of individual achievements in the labor force. That literature highlighted the extent to which individual achievements varied by labor market sector (Beck et al 1978), the size of the firm (Stolzenberg 1978), and authority in the work place (Kluegel 1978, Wolf & Fligstein 1979). Baron & Bielby (1980) termed this emerging body of literature "the new structuralism." While they saw it as a very positive development, they were also concerned about what they felt was a lack of coherence to the discussions. They argued for a tighter integration between research on stratification and studies of organizations, especially firms.

The emphasis on the role of work organization structures has clearly increased since 1980, but there is still a lack of coherence in the literature. While regrettable, this is at least understandable. The work-career stage of the status attainment model encompasses both a much longer period of the life course and a much more complex set of institutional arrangements than do the earlier stages. The work career can involve 40 or more years of moves through a sequence of jobs that are locations in a complex structure of economic organizations. Even charting the highly varied sequences is an awesome task, and conceptualizing the mechanisms by which they are produced and the relevance of their variation for the social stratification of the work force present an overwhelming challenge.

Yet much more is known now than in 1980. Even by 1980 it was recognized that workers in various occupations followed different career patterns (Gaertner 1980, Spilerman 1977), and attempts to identify common trajectories of work careers have been made since then, both for careers within a single organization (Rosenbaum 1984) and within the full labor force (Spenner et al 1982). It is increasingly clear that systematic links exist between positions in the labor force and that work-career trajectories can be identified.

Because of the significance of the characteristics of individual firms and the immense range of alternative career paths in the full labor force, much of the conceptual development and research on work careers has been focused on more delimited structures, such as "internal labor markets" (ILMs) (Althauser 1989). However, even ILMs are defined in different ways, sometimes referring to job ladders in a single firm, sometimes in an occupational category, sometimes in an industry. We currently have no adequate way of knowing, but it is likely that only a minority of work careers are restricted to any of these kinds of ILMs, although at least some kinds of workers' (especially professionals') careers are probably restricted to an occupational ILM.

The level of refinement of the definition of labor force locations is usually very different in studies of ILMs and careers in the full labor force. In almost all within-firm ILM studies, jobs and job ladders are defined in terms of the internal organization of a firm. Promotions in such cases involve moves between job levels, but they do not necessarily involve changes of occupation. Studies of careers and career lines within the full labor force necessarily adopt broader definitions of labor force locations, usually the occupational classifications of jobs. It is unlikely that the more refined categories used in ILM studies can be very useful in studies of the full labor force. In fact, even occupation categories may be too refined for studies of the full labor force (Spenner et al 1982), and clusters of occupations may need to be used to avoid overwhelming complexity (Haller et al 1985).

However, even if its direct utility in studies of the full range of work careers may be limited, the ILM at least provides a means of suggesting a source of orderliness in some careers. To the extent that ILMs exist, they can also be the source of "vacancy chains" (Chase 1991). Firms, industries, or occupations may provide sets of hierarchically ordered positions in which access to a higher level position requires candidates to be occupants of the next lower level position. If a higher position is vacated for some reason, a series of vacancies is produced as incumbents move up the hierarchy. However, such a sequence requires that opportunities to fill vacancies in the hierarchy be "closed" to those not already in the hierarchy rather than being "open" to outsiders (Sørensen & Tuma 1981).

The idea of "career lines" (Spilerman 1977, Spenner et al 1982) helps to bring these conceptualizations of opportunity structures together with the observed patterns of actual labor force careers. Career lines are observed sequences of job locations that are occupied by workers with sufficient frequency that they can be viewed as socially provided pathways. The term has a broader frame of reference than does ILM because it refers to job sequences in the full labor force career, not just that within a given firm, industry, or occupation. A worker who enters the position at the "entry portal" to such a sequence has a greater probability of moving to the next position in the sequence than do other workers, which means that the next position is not fully "open" to all comers.

Work-career lines, just as sequences of locations in educational settings, are probabilistic chains rather than fixed sequences. They may also be like sequences of locations in educational settings in that they have a cumulative effect on later outcomes. But they should be thought of as frequently trod pathways rather than deterministic linkages. Thus, observing career lines is not the same thing as understanding the reasons for their existence or for individuals' varied tendencies to enter or to follow them.

Rosenbaum (1990) notes that we know very little about the processes by which individuals move to advanced positions in an ILM or across positions in a career line. He also suggests that the differential development of skill and knowledge on the job is not just a matter of individual differences in ability, but it is influenced by opportunities for development provided by employers. He suggests that those opportunities vary systematically with previous attainments (academic or on-the-job) and that they follow a cumulative pattern he refers to as "career velocity"—those who move up early are offered further chances for advancement.

At least one study (Bills 1988) has found that formal educational credentials are more important for initial entry into a firm's labor force than they are for promotions within the firm. This is consistent with the idea that, when recruiting, employers use formal educational credentials as "signals" of possible job competence in the absence of information on more directly relevant job-related skills (Rosenbaum 1986). Once they have more directly relevant evidence, such crude signals are no longer important. Yet, Spilerman & Lunde (1991) suggest that formal educational credentials do affect promotions, but at particular times in the career and at particular levels in an organizational hierarchy.

Although we can identify career lines that move across firms or industries or occupations (Spenner et al 1982), we know much less about the mechanisms that produce them. There is evidence that stability of employment with a given firm is greater and careers are more orderly in the core sector (Tolbert 1982). Also, we know that the proportion of job shifts that are voluntary decreases with age, that seniority affects promotions, and that the longer one is in a given job, the greater the amount of nontransferable skill and knowledge is accumulated. However, little is known about the dynamics of individual labor-force careers or career lines outside of restricted structural settings (Rosenfeld 1992).

Work Careers in Comparative Perspective

A major reason for our limited knowledge of the dynamics of work careers is the lack of detailed data from large samples of workers including information on both their job shifts and the nature of their work settings and individual characteristics. Most comparative studies of careers depend on limited data from two points in time. One of the few comparative studies based on detailed work histories rather than simple two-point comparisons is Allmendinger's (1989) study of Norway, West Germany, and the United States. That study suggests that both Americans and Norwegians change jobs more often during their work careers than Germans do, but that Germans have more changes involving upward mobility. Work careers seem to be more structured and orderly in Germany than in either Norway or the United States. Maurice et al (1986) describe a similar contrast between West Germany and France.

As suggested in the previous section, a major factor related to career patterns that is emphasized by many of those who have conducted comparative analyses of careers is the way the structure of the educational system is related to the structure of the labor force. As we have seen, this varies considerably between societies. Featherman et al (1989) show a greater fluidity of class locations during work careers in Norway than in Germany, and they explain the difference in part by reference to the special characteristics of the German educational system. Allmendinger refers to Germany's as a "qualification labor market," and Maurice et al say that the German educational system has a greater "capacity to structure" the distribution of workers in the labor force. They both stress the importance of the fact that the German educational system awards credentials that are clearly related to particular kinds of jobs. In their comparison of career mobility in France, Austria, and the United States, Haller et al (1985) also note the importance of the occupation-specific credentials awarded by the Austrian educational system in contrast to the other two countries. In addition, they show that the Austrian "dual education" system (combining an apprenticeship with vocational schooling) leads to a proportion of young men beginning their work careers as skilled workers that is much higher than that found in either France or the United States.

These and other comparative studies have all wrestled with the problems noted in the previous section: deciding how to classify "first job," how to deal with education credentials gained after labor force entry, and how to deal with credentials obtained through non-regular postsecondary means. They have dealt with those problems in varying ways, as noted earlier, and it is thus not always possible to relate their findings to each other.

A multistage analysis of work career mobility of men in the United States and Great Britain (Winfield et al 1989) demonstrates the importance of these decisions. That analysis shows shifting patterns of the education-occupation relationship in the two countries during the first 20 years of labor force experience. Credentials gained through regular educational channels prior to labor force entry had a stronger association with the status of first job in the United States, but they had stronger associations with changes of job status 10 and 20 years after entry in Britain, and there was greater continuity of job status in the United States. It took the British men longer to "settle into" jobs commensurate with their academic credentials, but they ultimately did so almost as well as the American men.[6]

The role of part-time further education after labor force entry in Britain is even more striking. There is a very strong effect of further education on the changes in job status, especially 10 years after labor force entry,[7] but also notably after 20 years. The overall British education-occupation association is thus much stronger after 20 years than at labor force entry, although the difference would have been much smaller if further education credentials had been ignored. As the authors say (Winfield et al 1989, p. 303):

> While the overall pattern of social mobility from origin in the family of orientation to mid-career occupational placement is very much the same in the two societies, our results show that the pathways by which men reach those adult locations are quite different. The differences are largely due to the nature of the institutional arrangements of education in the two societies.

Career changes in the fit between educational attainment and occupational status are not the only societal differences in career mobility pathways due to varied mixes of education and work after leaving full-time school. Work careers are much more "orderly" in Germany and Austria, as compared with France and the United States (Allmendinger 1989, Haller et al 1985, König & Müller 1986, Maurice et al 1986). By "orderly" is meant that there are fewer job changes (especially in the early years in the labor force) and patterns of moves are more predictable—that is, they more often follow career lines. These differences derive in large part from the close association between credentials and occupations in Germany and Austria.

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[6] Winfield et al were able to utilize much more refined measures of educational attainment than did Treiman & Yip (1989) by using an induced variable methodology based on multiple indices of educational attainment. This strengthened the effect of educational attainment on occupational attainment beyond that shown in the Treiman & Yip analysis, especially in Britain where years of schooling (used by Treiman & Yip) is an inadequate measure

[7] Most of the British men's further education courses were taken during the first 10 years after labor force entry.

There is a suggestion in this literature that the role of ILMs differs depending on the degree of fit between educational credentials and kinds of occupations. König & Müller (1986) refer to Germany as having a "qualificational mobility space" while France has an "organizational mobility space." The organizations they refer to in France are the firms that employ young workers. Most of the French workers' job skills are obtained from on-the-job training, and they are skills that are usually firm-specific. In both France and the United States, firms provide career channels, and movement through them is facilitated by obtaining firm-specific skills that are seldom certified by nationally recognized credentials.

This literature suggests that there are two general types of societal patterns of linkage between labor force careers and the form of the educational system. In the first type, the educational system awards highly specific, occupationally relevant credentials and encourages specialization beginning at relatively early ages, well before labor force entry. Nationally recognized postsecondary credentials, systematically linked with prior educational specialization, are obtained through an employer-sponsored work-study program. The specialized credentials have the "capacity to structure" the flow of students into the labor force, and they provide a basis for orderly career patterns not wholly dependent on the opportunity structure in the particular firms where workers are employed.

In contrast, other educational systems award very general, nonspecific credentials that provide their students with little direction as they enter the labor force, and students' early job placements are much more subject to individual choice, community opportunity structures, and employer influences. Postsecondary training is not necessarily related to prior schooling, and it is unlikely to lead to nationally recognized credentials. Early work-career patterns are less orderly, and they are more dependent on the opportunities provided by workers' current employers.

Within the range of industrialized societies, Germany and Austria are the clearest examples of the first type of education-work relationship, and the United States and France are the clearest examples of the second type of relationship. Great Britain and Norway have institutional arrangements that lie between these two extremes, but Great Britain's are closer to those in Germany and Austria, and Norway's are closer to those in France and the United States.

OVERVIEW

The most general theme of this chapter is that educational and labor force institutional arrangements serve to channel the flow of individuals from origins to destinations in the stratification system. Those institutional arrangements constitute the sorting machines whose structures provide pathways to the levels in industrial societies' stratification systems. The linkages they provide between family and school, between school and work, and during the labor force career define the societies' opportunity structures. As a matrix of probabilistic connections, they establish the odds that individuals at particular locations at one stage in the stratification process will reach other particular locations at the next stage. Individual differences are bound to alter those odds at the individual level, but the institutional arrangements provide the most probable connections—and thereby make other connections less probable.

Recognizing the importance of institutional arrangements in channeling individuals from origins to destinations in the stratification system suggests important limitations of the original status attainment model. The most basic limitation is its failure to include indicators of the locations in educational and labor force organizations that define the possible pathways of social mobility. To include them, however, requires a much more elaborate model structure, one that recognizes that the original three-stage structure is a serious oversimplification. As the present review shows, each of those stages includes multiple possible moves between organizational locations. In addition, we need to recognize the reality of a "transition stage" between full-time schooling and postschooling full-time work.

It is not yet clear whether such an elaborated model would serve simply to explain the observed associations between the original measures of origin, educational attainment, first job, and later job, or whether it would also increase the power of the model. It may well be that its contributions would differ in different societies. However, a major advantage of such an elaborated model would be its ability to specify the strength of the linkages between locations in the network of career pathways.

It is especially important that we attend to the intersocietal differences reviewed here if we are to understand the role of institutional arrangements in social stratification processes. The institutional differences outlined above are very striking and suggest that the actual stratification processes in industrial societies vary considerably. It is thus clear that if an elaborated model of status attainment were used in comparative research, it would necessarily have different forms in different societies because the organizational locations vary greatly across societies.

Until quite recently, it has been assumed that there are only minor differences in patterns of intergenerational mobility across industrial societies. If that were so, the differences in stratification processes noted here could be seen as different kinds of sorting machines operating to produce the same patterns of outcome. Due to the work Ganzeboom et al (1991) subsume under "the third generation" of social mobility research, however, there is increasing evidence of societal variation in social mobility patterns (Ganzeboom et al 1989, Hout & Hauser 1992, Wong 1990). It is not clear at this point whether there is a systematic association between the observed patterns of social mobility and the variations in institutional arrangements discussed here, but that is an important possibility worthy of careful study.

This chapter is an attempt to make the role of organizational features of societal sorting machines more salient in stratification research and to describe how those machines vary across industrial societies. Further systematic analysis of the institutional arrangements and their role in the stratification process can help us bridge the gap between overall mappings of intergenerational mobility and microanalyses of the social psychology of social mobility. Several promising leads can be distilled from the review presented here that can be treated as rough-hewn hypotheses about the varied roles of institutional arrangements in the stratification processes in industrial societies. Among them would be the following:

1. Highly stratified educational systems (those with small proportions of a cohort at the higher levels) produce a stronger association between socioeconomic status of origin and educational attainment because the earlier definitive sorting occurs, the more it will be affected by social origin.
2. Decentralized (locally controlled) educational systems produce greater variation in the association between students' socioeconomic status of origin and their educational attainment than do centralized systems.
3. In educational systems with specialized kinds of schools and highly differentiated credentials, students with low levels of educational attainment have clearer job opportunities and more stable early employment experiences than do similar students in systems with comprehensive schools and very general credentials.
4. Workers in societies in which there are regularized combinations of work and schooling have more stable employment and more orderly early work careers than do workers in societies that more fully segregate school and work experiences.
5. Internal labor markets (especially within-firm ILMs) are more important in the work careers of workers in societies with general education credentials than in societies with differentiated occupation-related credentials.
6. There are clearer and more frequently followed education and work-career lines in societies with differentiated occupation-related education credentials than in those with very general credentials.

Since societies differ on all of the characteristics highlighted here, some of the hypothesized effects may tend to cancel each other. It is also possible that the extent to which these hypotheses are confirmed will vary depending on the overall social, political, and economic conditions in a society.[8] We need to know more about the associations, if any, between the institutional arrangements reviewed here and these overall societal characteristics. If there are such associations, comparative studies that include only two or three societies (e.g. comparisons of Germany and the United States) might lead to unwarranted conclusions about the general effects of institutional arrangements. There is much food for thought here.

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Literature Cited

Alexander KL, Cook MA, McDill EL. 1978. Curriculum tracking and educational stratification. *Am. Sociol. Rev.* 43:47–66

Allen WR, Farley R. 1986. The shifting social and economic tides of black America. *Annu. Rev. Sociol.* 12:277–306

Allmendinger J. 1989. *Career Mobility Dynamics: A Comparative Analysis of the United States, Norway and West Germany.* Berlin: Max Planck Inst. für Bildungsforschung

Althauser RP. 1989. Internal labor markets. *Annu. Rev. Sociol.* 15:143–61

Ball SJ. 1981. *Beachside Comprehensive: A Case-Study of Secondary Schooling.* Cambridge, Engl: Cambridge Univ. Press.

Baron JN, Bielby WT. 1980. Bringing the firms back in: stratification, segmentation, and the organization of work. *Am. Sociol. Rev.* 45: 737–65

Barr R, Dreeben R. 1983. *How Schools Work.* Chicago: Univ. Chicago Press

Beck EM, Horan PM, Tolbert CM II. 1978. Stratification in a dual economy: a sectoral model of earnings determination. *Am. Sociol. Rev.* 43:704–20

Bidwell CE, Friedkin NE. 1988. The sociology of education. In *The Handbook of Sociology,* ed. N Smelser, pp. 449–71

Bidwell CE, Rodriguez P. 1991. Organizational control in the high school workplace: a the-

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[8] The degree to which the economy is capitalist, corporatist, or socialist (Erikson & Goldthorpe 1987, Treiman & Yip 1989, Zagorski 1984); the distribution of the labor force among major economic sectors (Carroll & Mayer 1986); and the general health of the economy (Furlong 1992, Sørensen & Blossfeld 1989) have all been suggested as possible sources of societal differences. A number of other kinds of internal organization have also been linked to career patterns. For instance, Haller et al (1985) argue that a greater degree of nationalization of enterprises in France and a clearer segmentation of levels of occupations in Austria contributed to the different patterns of career mobility they observed. In addition, upturns or downturns in a society's economy during the careers being studied will probably affect career patterns (Blossfeld 1986).

oretical argument. *J. Res. Adolescence* 1: 211–29

Bills DB. 1988. Educational credentials and promotions: Does schooling do more than get you in the door? *Sociol. Educ.* 61:52–60

Blau PM, Duncan OD. 1967. *The American Occupational Structure*. New York: Wiley

Blossfeld H-P. 1986. Career opportunities in the Federal Republic of Germany: a dynamic approach to the study of life-course, cohort, and period effects. *Eur. Sociol. Rev.* 2:208–25

Borman KM, Spring JH. 1984. *Schools in Central Cities: Structure and Process*. New York: Longman

Breiger RL, ed. 1990. *Social Mobility and Social Structure*. Cambridge: Cambridge Univ. Press

Carroll GR, Mayer KU. 1986. Job-shift patterns in the Federal Republic of Germany: the effects of social class, industrial sector and organizational size. *Am. Sociol. Rev.* 51:323–41

Chase ID. 1991. Vacancy chains. *Annu. Rev. Sociol.* 17:133–54

Coleman JS. 1984. The transition from school to work. *Res. Soc. Strat. Mobility* 3:27–59

Coleman JS. 1988. Social capital in the creation of human capital. *Am. J. Sociol.* 94(Suppl.)· S95-S120

Corcoran M, Datcher L, Duncan GJ. 1980. Information and influence networks in labor markets. In *Five Thousand American Families*, ed. GJ Duncan, JN Morgan, 8.1–37. Ann Arbor: Univ. Mich., Inst. Soc. Res.

Erikson R, Goldthorpe JH. 1987. Commonality and variation in social fluidity in industrial nations. Part II. The model of core social fluidity applied. *Eur. Sociol. Rev.* 3:145–66

Featherman DL, Hauser RM. 1978. *Opportunity and Change*. New York: Academic

Featherman DL, Selbee LK, Mayer KU. 1989. Social class and the structuring of the life course in Norway and West Germany. In *Age Structuring in Comparative Perspective*, ed. DI Kertzer, KW Schaie, pp. 55–93. Hillsdale, NJ: Erlbaum

Foner A. 1979. Ascribed and achieved bases of stratification. *Annu. Rev. Sociol.* 5:219–42

Furlong A. 1992. *Growing Up In a Classless Society? School to Work Transitions*. Edinburgh: Edinburgh Univ. Press

Gaertner KN. 1980. The structure of organizational careers. *Sociol. Educ.* 53:7–20

Gamoran A. 1986. Instructional and institutional effects of ability grouping. *Sociol. Educ.* 59:185–98

Gamoran A. 1987. The stratification of high school learning opportunities. *Sociol. Educ.* 60:135–55

Ganzeboom HBG, Luijkx R, Treiman DJ. 1989. International class mobility in comparative perspective. *Res. Soc. Strat. Mobility* 8:3–84

Ganzeboom HBG, Treiman DJ, Ultee WC. 1991. Comparative intergenerational stratification research: compensation, reinforcement, or neutrality? *Annu. Rev. Sociol.* 17: 277–302

Garnier MA. 1982. Schooling processes and educational outcomes in France. *Qual. Quant* 15:151–77

Granovetter MS. 1974. *Getting a Job: A Study of Contacts and Careers*. Cambridge, MA: Harvard Univ. Press

Granovetter MS. 1986. Labor mobility, internal markets and job-matching: a comparison of the sociological and economic approaches. *Res. Soc. Strat. Mobility* 5:3–39

Haller M, König W, Krause P, Kurz K. 1985. Patterns of career mobility and structural positions in advanced capitalist societies: a comparison of men in Austria, France and the United States. *Am. Sociol. Rev.* 50:579–603

Hallinan MT. 1992. The organization of students for instruction in the middle school. *Sociol. Educ.* 65:114–27

Heyns B. 1974. Social selection and stratification within schools. *Am. J. Sociol.* 79:1434–51

Horan PM. 1978. Is status attainment research atheoretical? *Am. Sociol. Rev.* 43:534–41

Hout M, Hauser R. 1992. Symmetry and hierarchy in social mobility: a methodological analysis of the CASMIN model of class mobility. *Eur. Sociol. Rev.* 8:261–90

Ishida H. 1993. *Social Mobility in Contemporary Japan*. Stanford, CA: Stanford Univ. Press

Jencks J, Smith M, Acland H, Bane MJ, Cohen D, et al. 1972. *Inequality: A Reassessment of the Effect of Family and Schooling in America*. New York: Basic

Kalleberg A. 1988. Comparative perspectives on work structures and inequality. *Annu. Rev. Sociol.* 14:203–25

Keddie N. 1971. Classroom knowledge. In *Knowledge and Control*, ed. MFD Young, pp. 133–50

Kerckhoff AC. 1976. The status attainment process: socialization or allocation? *Soc. Forces* 55:368–81

Kerckhoff AC. 1990. Educational pathways to early career mobility in Great Britain. In *Res. Soc. Strat. Mobility*, 9: 131–57

Kerckhoff AC. 1993 *Diverging Pathways: Social Structure and Career Deflections*. New York: Cambridge Univ. Press

Kluegel JR. 1978. The causes and costs of racial exclusion from job authority. *Am. Sociol. Rev.* 43:285–301

Kolosi T. 1988. Stratification and social structure in Hungary. *Annu. Rev. Sociol.* 14:405–19

König W, Müller W. 1986. Educational system and labour market determinants of intragenerational mobility in France and West Germany. *Eur. Sociol. Rev.* 2:73–96

Kozol J. 1991. *Savage Inequalities: Children in America's Schools*. New York: Crown

Lareau A. 1989. *Home Advantage: Social Class and Parental Intervention in Elementary Education*. New York: Falmer

Marsden PV, Campbell KE. 1990. Recruitment and selection processes: the organizational side of job searches. See Breiger 1990, pp. 59–79

Maurice M, Sellier F, Silvestre J-J. 1986. *The Social Foundations of Industrial Power: A Comparison of France and Germany*. Cambridge, MA: MIT Press

McClendon McKJ. 1976. The occupational status attainment process of males and females. *Am. Sociol. Rev.* 41:52–64

Müller W, Karle W. 1992. Social selection in educational systems in Europe. *Eur. Sociol. Rev.* 8:233–54

Oakes J, Gamoran A, Page RN. 1992. Curriculum differentiation: opportunities, outcomes, and meanings. In *Handbook of Research on Curriculum: A Project of the American Educational Research Association*, ed. PW Jackson, pp. 570–608. New York: Macmillan

Ornstein MD. 1976. *Entry into the American Labor Force*. New York: Academic

Oswald H, Baker DP, Stevenson DL. 1988. School charter and parental management in West Germany. *Sociol. Educ.* 61:255–65

Peshar J, Popping R. 1986. Educational mobility in Hungary and The Netherlands: a loglinear comparison. *Res. Sociol. Educ. Social.* 6:45–78

Porter JN. 1974. Race, socialization and mobility in educational and early occupational attainment. *Am. Sociol. Rev.* 39:303–16

Raftery AE, Hout M. 1993. Maximally maintained inequality: expansion, reform and opportunity in Irish education, 1921–75 *Sociol. Educ.* 66:41–62

Raftery AE, Hout M. 1985. Does Ireland approach the meritocratic ideal? A logistic analysis. *Econ. Soc. Rev.* 16:115–40

Reskin B. 1993. Sex segregation in the workplace. *Annu. Rev. Sociol.* 19:241–70

Rosenbaum JE. 1984. *Career Mobility in a Corporate Hierarchy*. Orlando, FL: Academic

Rosenbaum JE. 1986. Institutional career structures and the social construction of ability. In *Handbook of Theory and Research for the Sociology of Education*, ed. JG Richardson, pp. 139–71. Westport, CT: Greenwood

Rosenbaum JE. 1990. Structural models of organizational careers: a critical review and new directions. See Breiger 1990, pp. 272–307

Rosenbaum JE, Kariya T, Settersten R, Maier T. 1990. Market and network theories of the transition from high school to work: their application to industrialized societies. *Annu. Rev. Sociol.* 16:263–99

Rosenfeld RA. 1992. Job mobility and career processes. *Annu. Rev. Sociol.* 18:39–61

Sewell WH, Haller AO, Portes A. 1969. The educational and early occupational attainment process. *Am. Sociol. Rev.* 18:82–92

Shavit Y, Blossfeld H-P, eds. 1993. *Persistent Inequality: Changing Educational Attainment in Thirteen Countries*. Boulder, CO: Westview

Shavit Y, Featherman DL. 1988. Schooling, tracking and teenage intelligence. *Sociol. Educ.* 61:42–51

Slavin RE. 1987. Ability grouping and student achievement in elementary schools: a best-evidence synthesis. *Rev. Educ. Res.* 57:293–336

Slavin RE. 1990. Achievement effects of ability grouping in secondary schools: a best-evidence synthesis. *Rev. Educ. Res.* 60:471–99

Sørensen AB, Blossfeld H-P. 1989. Socioeconomic opportunities in Germany in the postwar period. *Res. Soc. Strat. Mobility* 8: 85–106

Sørensen AB, Tuma NB. 1981. Labor market structures and job mobility. *Res. Soc. Strat. Mobility* 1:67–94

Sorokin PA. 1927. *Social Mobility*. New York: Harper

Spenner KI. 1988. Social stratification, work and personality. *Annu. Rev. Sociol.* 14:69–97

Spenner KI, Otto LB, Call VRA. 1982. *Career Lines and Careers*. Lexington, MA: DC Heath

Spilerman S. 1977. Careers, labor market structure, and socioeconomic achievement. *Am. J. Sociol.* 83:551–93

Spilerman S, Lunde T. 1991. Features of educational attainment and job promotion prospects. *Am. J. Sociol.* 97:689–720

Spring J. 1976. *The Sorting Machine*. New York: David McKay

Stevenson DL, Baker DP. 1991. State control of the curriculum and classroom instruction. *Sociol. Educ.* 64:1–10

Stolzenberg RM. 1978. Bringing the boss back in: employer size, employee schooling, and socioeconomic achievement. *Am. Sociol. Rev.* 43:813–28

Tolbert C. 1982. Industrial segmentation and men's career mobility. *Am. Sociol. Rev.* 47: 457–77

Treiman DJ, Yip K-B. 1989. Educational and occupational attainment in 21 countries. In *Cross-National Research in Sociology*, ed. ML Kohn, pp. 373–94. Newbury Park: Sage

Useem EL. 1992. Student selection into course sequences in mathematics: the impact of parental involvement and school policies. *J. Res. Adolescence* 1:231–50

Winfield I, Campbell RT, Kerckhoff AC, Everett DD, Trott JM. 1989. Career processes in Great Britain and the United States. *Soc. Forces* 68:284–308

Wolf WC, Fligstein ND. 1979. Sex and authority in the workplace: the causes of sexual inequality. *Am. Sociol. Rev.* 44:232–52

Wong RS-K. 1990. Understanding cross-national variation in occupational mobility. *Am. Sociol. Rev.* 55:560–73

Yogev A. 1981. Determinants of early educational career in Israel: further evidence for the sponsorship thesis. *Sociol. Educ.* 54:181–94

Zagorski K. 1984. Comparisons of social mobility in different socio-economic systems. In *International Comparative Research: Social Structures and Public Institutions in Eastern and Western Europe*, ed. M. Niessen, J Peschar, C Kourilsky, pp. 13–41. Oxford: Pergamon

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US SOCIOECONOMIC AND RACIAL DIFFERENCES IN HEALTH: Patterns and Explanations

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KEY WORDS: socioeconomic status, social class, race, health, racism

ABSTRACT

This chapter reviews recent studies of socioeconomic status (SES) and racial differences in health. It traces patterns of the social distribution of disease over time and describes the evidence for both a widening SES differential in health status and an increasing racial gap in health between blacks and whites due, in part, to the worsening health status of the African American population. We also describe variations in health status within and between other racial populations. The interactions between SES and race are examined, and we explore the link between health inequalities and socioeconomic inequality both by examining the nature of the SES gradient and by identifying the determinants of the magnitude of SES disparities over time. We consider the ways in which major social structures and processes such as racism, acculturation, work, migration, and childhood SES produce inequalities in health. We also attend to the ways in which other intervening factors and resources are constrained by social structure. Measurement issues are addressed, and implications for health policy and future research are described.

INTRODUCTION

Class is a very widely used concept in the social sciences in general, and sociology in particular. Although no consensus exists on exactly what it means

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and how it should be measured, class, however defined, has proven to be remarkably robust in elucidating the complexities of social and historical processes and in predicting variations within and between social groups in living conditions and life chances, skill levels and material resources, relative power and privilege. Health status is one arena where the effects of class are readily evident.

Similarly, race is one of the major bases of division in American life, and throughout US history racial disparities in health have been pervasive. The vast majority of studies focus on the black-white contrast, but a rapidly growing literature describes variations in health status within and between America's increasingly diverse racial populations. The US government requires all federal statistical reporting agencies to recognize four racial groups (American Indian or Alaskan Native, Asian or Pacific Islander, black, and white) and one ethnic category (Hispanic). Given that racial taxonomies are socially constructed and arbitrary, we treat all of these categories as racial groups. Moreover, since group designations should reflect generally recognized definitions as well as individual dignity, and there are varying views within racial groups with regard to terminology, we treat the following paired categories as alternative labels: American Indian or Native American, Hispanic or Latino, and black or African American.

This chapter reviews the evidence for persisting inequalities in health by socioeconomic status (SES) and race. We focus on the magnitude of the differences, the trends over time, and the major explanatory factors invoked to account for these variations. Methodological issues are also discussed, and directions for future research are outlined. We begin with a consideration of SES differences in health.

SOCIOECONOMIC STATUS AND HEALTH

SES is widely used as a proxy for social class in studies that examine variations in the distribution of disease, and it continues to be a remarkably robust determinant of variations in the rates of illness and death. The terms SES and social class are used interchangeably in the literature, but we treat SES as the preferred term except when explicit theories of social class are invoked. SES is typically assessed more in line with Weberian notions of stratification (income, education, occupation, and ownership of property) than with the Marxist emphasis on relationship to the system of production.

Recent reviews reveal that SES remains a persistent and pervasive predictor of variations in health outcomes (Bunker et al 1989, Haan & Kaplan 1986, Marmot et al 1987, Wilkinson 1986, Williams 1990, Adler et al 1993, Adler et al 1994, Feinstein 1993, Kreiger & Fee 1994, Kreiger et al 1993). A robust inverse association between SES and health status dates back to our earliest records and exists in all countries where it has been examined. Some of the clearest recent evidence for the United States comes from studies of mortality rates. Descriptive data from the National Longitudinal Mortality Study (NLMS) reveal, for example, that higher levels of both income and education are associated with lower rates of mortality (Rogot et al 1992). For blacks and whites, males and females, the mortality ratios for persons with a total family income of less than $5,000 (1980 dollars) per year were at least twice those of persons with incomes greater than $50,000 per year. Other recent studies have also found a strong inverse relationship between SES and mortality (Mare 1990, Feldman et al 1989, Duleep 1989, Pappas et al 1993, Haan et al 1987).

Research interest in the association between SES and mental health status has been declining over time (Dohrenwend 1990), but recent findings continue to demonstrate a powerful role for SES. The Epidemiologic Catchment Area study (ECA), the largest study of psychiatric disorders ever conducted in the United States, found that low SES predicted elevated rates of a broad range of psychiatric conditions (Holzer et al 1986, Robins & Regier 1991). Moreover, this inverse association between SES and psychiatric disorders was evident for both blacks and whites (Williams et al 1992).

The direction of causality between SES and health has been debated in the literature. The positive association between SES and health could reflect selection or "drift" processes where poor health is the cause of low SES. The competing social causation hypothesis views the elevated rates of illness among low SES populations as a consequence of their low socioeconomic circumstances. The direction of influence cannot be assessed in the typical study, but a growing number of cohort studies suggest that although health-driven downward social mobility occurs, it makes only a minor contribution to SES differences in health (Power et al 1990, Fox et al 1985, Wilkinson 1986).

Widening Inequality

The extent to which the association between SES and health has been widening in recent decades has emerged as a major issue in the SES literature. Three US studies have compared SES differences in mortality in recent studies with those reported by Kitagawa & Hauser (1973) from the 1960 Matched Records Study. Feldman et al (1989) found that mortality differentials by education increased substantially for white men between 1960 and 1984. Duleep (1989) noted that the observed mortality differentials by education and income in the late 1970s for men aged 25–65 years old were not smaller than those in 1960. A comparison of 1960 mortality differentials with those from the 1986 National Mortality Follow-back Survey found evidence for an increase in socioeconomic disparity (Pappas et al 1993).

Much of the widening disparity in health status reflects more rapid gains in the health status for high SES than for low SES groups, but for some health indicators, evidence suggests a worsening health status at the low end of the socioeconomic spectrum. A recent study by Wagener & Shatzkin (1994), for example, documents that although the SES differential in breast cancer narrowed between 1969 and 1989, breast cancer mortality has been declining for women in high SES counties in the United States, but rising for women in low SES counties.

Differences between SES groups in accessibility, utilization, and quality of care, or differences in the benefits derived from medical care, are contributing factors to the widening inequality. Mandinger (1985) shows that in the wake of the large budget cuts in health and social service spending early in the Reagan administration, an increase occurred in the number of pregnant women not receiving prenatal care, in the incidence of anemia in pregnant women, and infant mortality rates among poverty populations in 20 states. Similarly, Lurie et al (1984) found evidence of significant deterioration in access to care, satisfaction with care, and health status in a population of medically indigent adults in California six months after their termination from Medicaid. For example, their mean diastolic blood pressure increased by 10 points (mm Hg).

However, an increase in economic inequality is apparently the major driving force behind widening health disparities. Since the mid-1970s in the United States, there have been an increase in income inequality, a growing concentration of wealth among the highest income groups, and a worsening of the economic conditions of a substantial portion of the population (Danziger & Gottschalk 1993). The economic expansion of the 1980s was accompanied by a deterioration in the standard of living for a majority of households. Compared to the 1970s, more American adults in the 1980s fell from middle- to low-income status, and low-income families found it increasingly difficult to climb into the middle class (Duncan et al 1993). This polarization of the income distribution may have resulted from changes in the economy that led to a decline in manufacturing jobs and simultaneous increases in both low-wage (service industry and low-skilled) and high-wage (high technology industries) employment.

Income inequality has also increased in Western European countries (Danziger & Gottschalk 1993), and a pattern of widening socioeconomic differentials in mortality is also evident in England, France, Finland, Norway, and the Netherlands (DHSS 1980, Kunst & Mackenbach 1994). A study of mortality trends over time in England, Wales, and the Netherlands documents most clearly for England and Wales, although the pattern for the Netherlands is consistent, that a widening of mortality differences between SES groups is partly due to differences in the decline of mortality from conditions amenable to medical intervention. However, the contribution of medical care is limited. The higher SES groups also experienced larger improvements in mortality than did their lower SES counterparts from those causes of death where medical care does not play a major role (Mackenbach et al 1989).

Nature of the Gradient

The nature of the SES gradient in health status has generated considerable interest. Some studies indicate a stepwise progression of risk in the relationship between SES and health status, with each higher level of SES associated with better health status. The most impressive evidence of this pattern comes from the Whitehall Study of civil servants in England (Marmot et al 1984, Marmot et al 1991). This study population consists of adults mainly from one ethnic group, residing in one geographic area, stably employed in white-collar jobs, with limited exposure to industrial hazards. Workers in the lowest occupational grades had a rate of mortality three times higher than those in the highest occupational grades. However, each higher grade of employment had lower levels of mortality and better health status than the prior grade. Further, homeowners engaged in professional employment who own two cars have lower mortality than their counterparts who own only one car (Goldblatt 1990). Thus, elevated rates of disease and death are not restricted to the low occupational grades but are evident even for privileged groups, when compared to those of highest SES.

Some recent reviews have noted a similar pattern in at least some studies conducted in the United States, and they have concluded that this finely graded pattern is characteristic of the association between SES and health status (Adler et al 1993, Adler et al 1994). Accordingly, there has been great interest in understanding the determinants of this finely stratified mortality difference that appears to run from top to bottom of the social hierarchy. Several studies document that the gradient is nonetheless characterized by a threshold that predicts a weakening of the association between SES and health. That is, beyond some level of SES, usually around the median for income, additional increases in SES have little or a greatly diminished effect in reducing mortality and morbidity rates. For example, both the Kitagawa & Hauser (1973) and the Pappas et al (1993) studies of mortality document diminishing returns to increases in socioeconomic status after a certain level of income. House et al (1990) also report a similar pattern for morbidity indicators. The health gains due to income are small for households above $20,000 per year. Recent analyses of the association between income and mortality in the Panel Study of Income Dynamics (PSID) also find large reductions in the mortality rate associated with increases in income at low levels of SES, but smaller declines in mortality linked to additional income at higher levels of SES (McDonough et al 1995). Wilkinson (1986) reports a similar pattern for income data in Great Britain.

Evidence suggests that even in a single study, patterns of association vary for different indicators of SES. For example, Rogot et al (1992) found in the NLMS a continuous linear gradient between income and mortality for African

Americans and whites, males and females, aged 25–64. In contrast, although an inverse association exists between education and mortality, a graded pattern of association was not evident for all of the four race-sex groups. Clearly needed now are more systematic efforts to identify the conditions under which particular indicators of SES manifest patterns of linear or nonlinear associations with health outcomes. We need to identify the thresholds after which weaker effects of SES are observed, and we also need to identify the social, psychological, material, and especially occupational resources and risks that characterize each level of SES.

Measuring Socioeconomic Position

Numerous variables are used to measure SES: Income, education, and occupational status are the most common. Although SES tends to be related to health outcomes irrespective of the indicator used, each SES measure has its own set of advantages and limitations. Some researchers suggest that education is the most stable and robust indicator of SES (Kitagawa & Hauser 1973, Liberatos et al 1988) or the most practical and convenient in some contexts (Williams et al 1994).

However, the education measure suffers from several limitations (Krieger & Fee 1994). First, in at least some national data, inequalities in health associated with income are larger than those associated with education, such that using education as a measure of SES may minimize estimates of social inequalities in health. Second, the lack of volatility in education levels for most adults precludes assessing how health status is affected by changes in SES. Third, many studies that use education as an indicator of SES are individualistic in approach and do not incorporate information about the education level of other members of the household. Fourth, as discussed in greater detail later, the return for a given level of education varies importantly by race and gender.

Numerous problems appear with the measure of income. Analyses using income are more likely than those of some other SES indicators to be open to reverse causation arguments. That is, poor health can lead to declines in income such that the association between low income and health status can be a cause rather than a consequence of poor health. In addition, income information may be especially sensitive for some, resulting in higher nonresponse for income questions than for other SES indicators. Measuring income well can also be costly and time-consuming. Income is probably best measured in the Survey of Income and Program Participation, which uses 50 questions to assess annual income. Moreover, the poverty measure, a widely used indicator of income, is almost 40 years old and of questionable current applicability (Sheak 1988, Ruggles 1990).

Income is also a more unstable measure of SES than is either education or occupation. Family incomes throughout the life cycle are characterized by considerable volatility, with many households experiencing sharp losses in income, and a substantial portion of the population is at risk of experiencing such losses. Duncan (1988) shows, for example, that between 1969 and 1979 in the United States, between 20% and 35% of women between the ages of 25 and 75 experienced poverty at least once. The rates of poverty were higher among women than among men. Persistent poverty, defined as living in poverty for more than half of the eleven-year period, increased with age from 5% among women aged 25–45 to 11% among those in the 66–75 year age group. Thus, volatility of income also was patterned by age. Measures of education miss this dynamic component of SES, and although highly educated persons are not completely shielded from the volatility of income, they tend to be protected from income drops to near-poverty levels.

Rather than using the volatility of income as a reason not to collect income information, the dynamic nature of income highlights the importance and potential contribution of indicators of long-term economic well-being. Three longitudinal studies have documented that measures of average income capturing long-term exposure to economic deprivation are more strongly related to childhood health outcomes than are single-year indicators of economic status (Miller & Korenman 1994, Takeuchi et al 1991, Duncan et al 1994). These findings highlight the importance of having longitudinal data with multiyear or long-term measures of income. This larger effect for long-term economic deprivation may reflect the fact that families may use assets or credit to cushion the impact of short-term economic losses.

Permanent income or wealth may thus be better measures of economic status than is annual household income. In addition, wealth may be more strongly linked to social class location than is earned income. In a study of 100,000 black, white, and Hispanic youth between 1973 and 1990, parental home ownership had a large effect on both school dropout and college entry independent of parental income, education, and occupational status (Hauser 1993). More health studies should include indicators of assets or wealth. In the National Longitudinal Survey of the Labor Market Experience of Mature Men (NLS), Mare (1990) found that family assets were strongly related to mortality independent of the effects of education and first occupation. Studies in Britain also find that home and car ownership are predictive of decreased mortality risk (Goldblatt 1990). The extent to which traditional measures of economic consumption such as the monthly cost of housing and food are predictors of health status is another important but neglected issue.

Occupational status is likely to be a better indicator of long-term income than is income at a single point in time. Nonetheless, there is some volatility to occupational status, and this may also have consequences for health. A national study of black and white male workers found that one third of the sample changed their occupational class over the 7–13 years of follow-up

(Waitzman & Smith 1994). Compared to whites who remained in professional and technical jobs between baseline and follow-up, African American and white males who remained in the lower occupational classes or made certain transitions, especially into lower occupational classes, had significantly higher rates of new cases of hypertension.

Considering multiple measures of occupational status can also shed light on underlying processes. Mare (1990) studied the association of father's occupation, first occupation, and current occupation to mortality in the NLS. Father's occupation was inversely related to mortality, but the effects of first occupation on mortality were stronger than those of father's occupation, and they appeared to be due to the ability of sons from higher SES origins to acquire more schooling. Current occupation and family assets were also linked to mortality. The association between multiple measures of occupation and mortality can be complex. Moore & Hayward (1990) found in the NLS data that the occupational category with the highest mortality risk for longest occupation was different from that for most recent occupation.

A practical barrier to the use of occupation for analyses of national mortality data in the United States is that the numerator and denominator do not use the same units of measurement. Denominator data comes from the census, which collects information about current occupation. The 21 states that record occupational information on death certificates collect information about usual, instead of current, occupation (Krieger & Fee 1994). The collection of uniform data about both current and usual occupation could alleviate this problem.

Krieger & Fee (1994) emphasize that social class should be measured at the level of the individual, the household, and the neighborhood. At the individual level, class-based (occupational) measures can capture exposure to occupational health risks, while household SES measures can provide information regarding standards of living and cultural patterns. Community level measures of SES can provide information about neighborhood-related conditions such as exposure to environmental hazards and levels of neighborhood violence. Two California studies have found that measures of deprivation based on area characteristics were associated with mortality independent of individual socioeconomic status indicators (Haan et al 1987, Krieger 1991). Moreover, Krieger (1991) found that a deprivation measure based on census block characteristics (smaller unit of analysis) explained more variance than did the one based on the characteristics of the census tract. These studies document that area characteristics provide additional information about social inequalities in health that are not captured by individual level data. Similarly, British studies have found a robust relationship between area-based measures of social deprivation and health status (Townsend et al 1988, Carstairs & Morris 1989). Future research needs to identify the specific characteristics of residential environments that are deleterious to health.

Greater attention also needs to be given to theoretically driven measures of social class. Krieger (1991) found that a relational measure of social class (that emphasizes social class location based on relationship to others and to property through employment) was more strongly related to women's reproductive history outcomes than was a measure of household poverty. The three class categories utilized were working class, not working class, and other class. An alternative measure for assessing objective class location distinguishes social class based on the possession of productive assets: property assets, skill assets, and organizational assets (Baxter 1994). There is growing awareness that SES, as well as social class, attempts to capture a dynamic multidimensional process, and greater attention needs to be given to modeling the joint effects of SES variables.

Other Emerging Issues

The age patterning of the association between SES and mortality has been addressed in recent studies. Early studies noted that SES differentials in health status tend to be largest during middle age but are relatively small at older ages (Antonovsky 1967). Analyses of the NLMS data found that although the association between education and mortality exists for persons aged 65 or older, it was not as strong as at the younger ages (Rogot et al 1992). Similarly, House et al (1990), using two national probability samples, document that the association between SES and morbidity (chronic conditions, functional status, and activity limitation) is most marked between ages 45–64, but narrows with increasing age. Replications and extensions of these cross-sectional findings with short-term longitudinal data provide further support for this pattern with both income and education (House et al 1994). However, the evidence is not uniform. Recent analyses by Wu & Ross (1994) found the opposite pattern. Using two nationally representative telephone samples, they found that educational differences for three measures of health (physical functioning, self-reported health, and physical well-being) widens with increasing age. It is not clear if these findings reflect differences in the measurement of health status or the coverage of the population.

Women are overrepresented among the poor, but the nature of the association between SES and women's health status is not well understood. The measurement of occupation has been particularly problematic for women. Findings are inconsistent for the few studies that have assessed the association between occupation and women's health. Strong linear SES gradients have been found in some studies, while others report relatively weaker associations than those obtained for men (Arber 1987, 1991). In some studies occupation has been unrelated to mortality risk for women (Passannante & Nathanson 1985, Hibbard & Pope 1991, Moen et al 1989).

It is likely that these inconsistencies reflect, at least in part, the limitations of the measurement of SES. Frequently, married women are assigned to the occupational class of their husband, while single women are given their own or their father's class position. The assignment of women to the occupational status of male relatives is increasingly problematic given the growing number of women who are employed outside of the home and the increasing number of female-headed households (Liberatos et al 1988). Most of the widely used classification systems are based on the occupational patterns of men. Gender-based differences in income and education within occupations and the gender segregation of employment suggest that the inclusion of women may require modifications in occupational classification schemes (Haug 1977, Powers & Holmberg 1982).

Evidence from the United Kingdom reveals that for married women, social class based on the husband's occupation predicts mortality better than does social class based upon the woman's own occupation (Moser et al 1990). For single women, own social class is a powerful predictor. A recent study of the relationship between objective class location and subjective class identification for men and women in the United States, Sweden, Norway, and Australia found that husbands' class location is a major determinant of subjective class identity for women (Baxter 1994). Thus, women's increasing independence from men appears not to undermine the conventional view of class analysis. These findings also suggest the importance of studying social class at the household level, as opposed to only the individual level, for women.

There is growing interest in understanding the contribution of biological factors to human behavior in general and processes of social stratification in particular. Ellis's review (1993) suggests that genetic and physiological factors account for a substantial portion of the variation in both adult education and earning levels. For example, sex hormone levels, especially testosterone, are associated with individuals' career choices, and some twin studies suggest that as much as 40–50% of the variation in vocational interest can be attributed to genetic factors. However, cause and effect remain problematic because a person's experiences also affect hormone levels. In addition, the determinants of individual risks of disease are often different from those of population risks of disease (Rose 1985). It is likely that genetic factors play a larger role in the causes of individual variations in disease than they do in socioeconomic group differences in health status. While guarding against biological determinism is important, social scientists need to give greater attention to the biological mechanisms and processes through which social factors affect health and to the interrelationships between genetic factors and social variables. Much remains to be understood about the ways in which genetic susceptibilities combine additively or interactively with exposures in the social and physical environment to affect health at different stages of the life cycle and for persons living under varying environmental conditions.

RACIAL/ETHNIC DIFFERENCES IN HEALTH STATUS

The United States is relatively unusual among industrialized countries in that it reports the health status of its population based on race (Navarro 1990). Most other countries focus on social class differences. For most of this century, the contrast between whites and nonwhites (a category that consisted almost exclusively of blacks) was the basis of differentiation. Since the late 1970s there has been a growing emphasis on collecting more data on the racial and ethnic minority populations that constitute an increasing proportion of the American population. Recent reviews reveal that race and ethnicity remain potent predictors of variations in health status (Braithwaite & Taylor 1992, Furino 1992, Livingston 1994, Zane et al 1994).

The most recent report card on the health of the US population presents infant and adult mortality rates by race (National Center for Health Statistics 1994a). Infant mortality rates are reported for major subgroups of the Asian and Pacific Islander American (APIA) and the Hispanic population, but subgroup differences were not available for adult mortality. The infant mortality rate for blacks is twice that of whites, and American Indians also have elevated infant mortality rates compared to the white population. The APIA population and its four major subgroups have rates that are lower than those of whites, while the rate for Hispanics is equivalent to that of whites. However, variation occurs within the Hispanic category: Puerto Ricans have higher infant mortality rates than do the other Hispanic groups and the white population. The report also revealed that the age-adjusted death rate for the entire black population is dramatically higher than that of whites, but all of the other racial/ethnic populations have death rates lower than the white population, with the APIA population having the lowest death rates.

These overall data mask important patterns of variation for subgroups of these populations and for specific health conditions, a point readily evident in recent overviews of the health of the Hispanic population (Sorlie et al 1993, Vega & Amaro 1994). While Latinos have lower death rates for the two leading causes of death (heart disease and cancer) than do non-Hispanics, they also have higher mortality rates than do non-Hispanic whites for tuberculosis, septicemia, chronic liver disease and cirrhosis, diabetes, and homicide. Death rates of Hispanics also exceed those of whites in the 15–44 age group (Fingerhut & Makuc 1992). Moreover, Hispanics have elevated rates of infectious diseases such as measles, rubella, tetanus, tuberculosis, syphilis, and AIDS. The prevalence of obesity and glucose intolerance are also particularly high, especially among Mexican Americans. Similar to the findings for infant mortality, adult mortality rates for Puerto Ricans are higher than the other Hispanic groups. However, even among Puerto Ricans, the mortality rate is lower than for white non-Hispanics and considerably lower than for African Americans.

Specific subgroups of the APIA population have elevated rates of morbidity and mortality across a number of health indicators. The Native Hawaiian population has the highest cancer rates of any APIA population in the United States (Lin-Fu 1993) and the highest death rates due to heart disease of any racial group in the United States (Chen MS 1993). Rates of stomach cancer are high among Japanese Americans, and Chinese Americans have an incidence of liver cancer that is four times higher than that of the white population (Lin-Fu 1993). Very high rates of obesity are evident for Native Hawaiians and Samoans, and these populations, along with Asian Indians, Japanese Americans, and Korean Americans, have prevalence rates of diabetes that are more similar to those of the black population than of the white population (Crews 1994). Death rates for Native Americans are high for the under-45 age group, and suicide rates for American Indian youth are two to four times higher than those of any other racial group (Fingerhut & Makuc 1992). Native American youth also have higher levels of alcohol and other drug use than does any other racial group (Smith 1993).

Worsening Health Status

As part of the increasing income inequality in the United States, the gains in economic status of blacks relative to that of whites have stagnated in recent years (Smith & Welch 1989). Moreover, for several economic indicators there has been an absolute decline in the economic status of African Americans. For example, unlike the pattern for white families, low-income black and Hispanic families have experienced absolute declines in family income since 1973, and weekly wage and salary income declined for all black and Hispanic males below the 90th percentile of income between 1979 and 1987 (Karoly 1993). Similarly, the percentage of black children living in poverty increased from 41% to 44% between 1979 and 1988 (Hernandez 1993). Similar to the findings noted earlier for SES, this decline in black economic well-being and increase in black-white inequality is associated with worsening black health across a number of health status indicators.

The gap in life expectancy between blacks and whites widened between 1980 and 1991 from 6.9 years to 8.3 years for males and from 5.6 years to 5.8 years for females (NCHS 1994b). Moreover, for every year between 1985 and 1989, the life expectancy for both African American men and women declined from the 1984 level, although an upturn has been reported in the most recent data (NCHS 1994a). A slower rate of decline among blacks than whites for heart disease is the chief contributor to the widening racial gap in life expectancy, while HIV infection, homicide, diabetes, and pneumonia are major causes of decreasing life expectancy for blacks (Kochanek et al 1994).

The age-adjusted death ratios for blacks and whites were greater in 1991 than in 1980, and the annual number of excess deaths for the African American, compared to the white population, increased from 60,000 in 1980 to 66,000 in 1991 (NCHS 1994b). During this period, the overall age-adjusted death rate decreased more rapidly for white males and females than for their black counterparts. Under the age of 70, three causes of death—cardiovascular disease, cancer, and problems resulting in infant mortality—account for 50% of the excess deaths for black males and 63% of the excess deaths for black females. Homicide accounts for 19% of the excess deaths for black males and 6% for black females. An analysis of death rates between 1900 and the present reveals that black-white health inequality among men is currently at an all-time high for this century (Cooper 1993). In some depressed urban environments there has been no improvement in the health status of the black population over time. For example, Freeman (1993) shows that, in contrast to a steady decline in national mortality rates for both blacks and whites between 1960–1980, there was no change in mortality for African Americans in Harlem over this 20-year period. However, the potential contribution of selection processes via migration to this pattern was not assessed.

The gap in infant mortality rates for white and black babies widened for each sex between 1980 and 1991 (NCHS 1994b). Rates of both preterm delivery (Rowley et al 1993) and low birth weight (NCHS 1994b) have remained stable for white women but have been increasing among African Americans. A widening differential between African Americans and whites is also evident for rates of sexually transmitted diseases (Castro 1993). Between 1986 and 1989, cases of gonorrhea and syphilis decreased by 50% and 11%, respectively, for whites. In contrast, gonorrhea declined by only 13% for blacks while syphilis increased by 100%. The increase in syphilis is thought to be associated with increases in the use of crack cocaine and related increases in prostitution.

Major Historical Events

This recent evidence of the deterioration in the health of the African American population emphasizes the importance of considering the larger historical context in understanding the health status of population groups. Mullings (1989) has suggested that the Civil Rights Movement, for example, has had important positive effects on black health. By reducing occupational and educational segregation, it improved the SES position of at least a segment of the black population and also influenced public policy to make health care accessible to larger numbers of people. Consistent with this hypothesis, one study found that between 1968 and 1978 blacks experienced a larger decline in mortality rates (both on a percentage and absolute basis) than whites (Cooper et al 1981).

More recently, the presidential campaign of Jesse Jackson may have had a positive short-term impact on the health of the African American population.

Using four-wave data from the National Study of Black Americans that span the period 1979–80 to 1992, Jackson et al (1995) found that during the third wave of data collection (1988), the reported levels of physical and mental well-being were at their highest. In addition, the proportions of respondents reporting that they had experienced racial discrimination and that they perceived whites as wanting to keep blacks down were at their lowest levels. Contemporaneously, Jesse Jackson, a black male, was making the most successful run for the presidency of the United States that had ever been made by an African American in the history of the United States. These researchers suggest that this political event may have had spillover effects for black adults' perceptions of America's racial climate and their health status.

The massive internal migration of blacks in the United States earlier this century has been an important influence on the African American population. Although the initial economic and longer-term political gains linked to migration may have had positive health consequences, the black migration may have also had profound adverse effects on health (Williams 1995a). First, the black migration disproportionately distributed the African American population to urban residential areas where living conditions are hostile to life and health. Unlike the white urban poor who are dispersed throughout the city, with many residing in relatively safe and comfortable neighborhoods, the black poor are concentrated in depressed central-city neighborhoods (Wilson 1987) where the stress of poor urban environments can lead to illness (Harburg et al 1973, Haan et al 1987). A recent study in Harlem, one of the poorest areas of New York City, documented that black males between the ages of 25–44 in Harlem are six times more likely to die than are their white counterparts in the United States (McCord & Freeman 1990). Moreover, the life expectancy of blacks in Harlem is lower than that of persons in Bangladesh, one of the poorest countries in the world.

Wilson (1987) suggests that the concentration of black poverty in the inner city is due to the out-migration of middle class blacks to other areas. In contrast, Massey & Gross (1993) found that three complementary mechanisms were responsible: the wholesale abandonment of black and racially mixed areas by middle class whites, the selective migration of poor people into black neighborhoods, and the net movement into poverty of blacks living in segregated areas. Living conditions in inner-city areas are also deteriorating over time. The economic status of central-city African Americans has declined relative to other urban blacks. In 1940, central-city blacks earned 10% more than did other black urban dwellers, but by 1980 they were receiving 10% less (Smith & Welch 1989). There is also growing concern about the health consequences of stress in residential environments such as the high level of community violence in many depressed urban environments (Gabarino et al 1992).

The internal migration of the African American population also affected health by changing health behaviors in ways that lead to high risks of disease and death. With the great migration and urbanization of black Americans came a dramatic rise in their use of alcohol and tobacco, and a reversal in the racial distribution of alcohol and tobacco use (Williams 1991). During the first half of this century, the prevalence of cigarette smoking and alcohol abuse was higher for whites than for blacks. The great migration shifted a considerable portion of the black population from the relatively "dry" rural South, where social life revolved around churches and family associations, to the "wet" areas of the urban North, where taverns and associated alcohol use were an integral part of social life (Herd 1985). Moreover, by producing feelings of alienation, powerlessness, and helplessness, life in urban settings created the need for individuals to mask these feelings or obtain temporary relief from them by consuming tobacco and alcohol. African Americans have been special targets of the advertising of both the tobacco and the alcohol industries (Davis 1987, Singer 1986), targeting that dates back to the 1950s (Levin 1988).

A recent provocative theory designed to account for the high rates of hypertension among African Americans also gives a central role to historical factors (Wilson & Grim 1991). According to the "slavery hypothesis" the historic conditions of slavery, especially those linked to capture in Africa and the transatlantic slave voyage, resulted in the preferential survival of those Africans who had a genetic propensity to conserve sodium and water. Contemporary African Americans have inherited this trait, which is responsible for the elevated rates of high blood pressure. Despite its deceptive simplicity and intuitive appeal, like earlier biological explanations, it locates racial disparities in health inside of the individual and pays scant attention to current living conditions. Serious questions have been raised regarding the plausibility of a historic genetic "bottleneck" being a key determinant of current genetic characteristics (Jackson 1991), and about the validity of the historic data that have been invoked to support this theory (Curtin 1992). Moreover, there is abundant evidence that the current social circumstances of African Americans play a major role in accounting for their elevated rates of high blood pressure (Williams 1992).

Race and SES

Socioeconomic differences between racial groups are largely responsible for the observed patterns of racial disparities in health status. Race is strongly correlated with SES and is sometimes used as an indicator of SES. For example, while 11% of the white population is poor, poverty rates for the African American and Hispanic population are 33% and 29%, respectively. Not surprisingly, differentials in health status associated with race are smaller than those associated with SES. For example, in 1986 persons with an annual household income of $10,000 or less were 4.6 times more likely to be in poor health than those with income over $35,000, while blacks were 1.9 times more likely to be in poor health than whites (Navarro 1990). Thus, race differentials were less than half of the SES differentials.

Researchers frequently find that adjusting racial disparities in health for SES substantially reduces these differences. In some cases the race disparity disappears altogether when adjusted for SES (Baquet et al 1991, Rogers 1992). Two recent studies provide striking evidence of the contribution of SES to observed racial differences in violence and illegal drug use. Greenberg & Schneider (1994) showed that rates of violent deaths in New Jersey were associated not with race per se, but with residence in urban areas with a high concentration of undesirable environmental characteristics such as waste incinerators, landfills, and deserted factories. Violent deaths from homicide, poisoning/drug use, falls, fires, and suicide in these marginal areas were ten times higher for males and six times higher for females than for their counterparts in the rest of New Jersey. Moreover, deaths in these marginal areas were high for whites and Hispanics as well as blacks, females as well as males, and middle-aged and elderly populations as well as youthful populations. Lillie-Blanton et al (1993) also found that a twofold higher prevalence of crack cocaine use for blacks and Hispanics compared to whites was reduced to nonsignificance when adjusted for census indicators of social environmental risk factors. Thus, failure to adjust racial differences for SES can reinforce racial prejudices and perpetuate racist stereotypes, diverting both public opinion and research dollars from the underlying social factors that are responsible for the pattern of risk distribution.

More frequently, it is found that adjustment for SES substantially reduces but does not eliminate racial disparities in health (Cooper 1993, Otten et al 1990, Krieger & Fee 1994). That is, within each level of SES, blacks generally have worse health status than whites. One recent study found higher infant mortality rates among college-educated black women than among their similarly situated white peers (Schoendorf et al 1992). Moreover, some studies find that the black-white mortality ratio actually increases with rising SES. This is clearly the case for infant mortality where the black-white gap is narrowest among women who have not completed high school, and highest among women with a college education (Krieger et al 1993).

Kessler & Neighbors (1986) emphasize the importance of systematically testing for interactions between race and socioeconomic status. They reanalyzed data from eight epidemiologic surveys and demonstrated that, although controlling for SES reduced to nonsignificance the association between race and psychological distress, low-SES blacks had higher rates of distress than did low-SES whites. However, the findings have not been uniform. Analyses of data from the large ECA study found that low-SES white males had higher rates of psychiatric disorders than did their black peers (Williams et al 1992).

Among women, low-SES black females had higher levels of substance abuse disorders than did their white peers. These findings suggest the importance of distinguishing distress from disorder, as well as the need to understand the interactions among race, gender, and class.

One reason for the persistence of racial differences despite adjustment for SES is that the commonly used SES indicators do not fully capture the economic status differences between households of different races. For example, racial differences in wealth are much larger than those for income. There are large racial differences in the inheritance of wealth and intergenerational transfers of wealth. Table 1 shows that while white households have a median net worth of $44,408, the net worth was $4,604 for black households and $5,345 for Hispanic households (Eller 1991). Compared to white households, black households had a significantly greater percentage of their net worth in durable goods such as housing and motor vehicles, and a significantly lower percentage of their net worth in financial assets. Moreover, at every income level, the net worth of black and Hispanic households is dramatically less than that of white households. Thus, in studies of racial comparisons, measures of assets are necessary for the identification of the economic status of the household.

In some cases where blacks are more exposed to particular risk factors, these risk factors appear to have weaker effects for the black population. In a national study in which black children constituted 75% of those in the category of lowest long-term income, persistent poverty was unrelated to either stunting or wasting for blacks, unlike the strong pattern evident for non-Hispanic whites and Hispanics (Miller & Korenman 1994). Similarly, although black infants have twice the low-birth-weight risk of whites, low birth weight is more strongly linked to infant mortality in the neonatal period for blacks than for whites (Hogue et al 1987).

Table 1 Median net worth in 1991 by monthly household income quintiles for whites, blacks, and Hispanics

Household income	White	Black	Hispanic
All	$44,408	$4,604	$5,345
Lowest quintile	$10,257	$1	$645
Second quintile	$25,602	$3,299	$3,182
Third quintile	$33,503	$7,987	$7,150
Fourth quintile	$52,767	$20,547	$19,413
Highest quintile	$129,394	$54,449	$67,435

(Source Eller 1994)

Racism

Another reason for the failure of SES indicators to completely account for racial differences in health is the failure of most studies to consider the effects of racism on health. A growing body of theoretical and empirical work suggests that racism is a central determinant of the health status of oppressed racial and ethnic populations (King & Williams 1995, Williams et al 1994, Williams 1995b, Krieger et al 1993, Cooper 1993). Racism is viewed as incorporating ideologies of superiority, negative attitudes and beliefs toward racial and ethnic outgroups, and differential treatment of members of those groups by both individuals and societal institutions. Racism can affect health in at least three ways (Williams et al 1994, Cooper 1993).

First, it can transform social status such that SES indicators are not equivalent across race. There are large differences related to race in the quality of elementary and high school education, so that blacks bring fewer basic skills to the labor market than do whites (Maxwell 1994). In addition, as Table 2 indicates, whites receive higher income returns from education than blacks and Hispanics. These racial differences are larger among males than among females, and the black-white income gap for males does not become narrower with increasing years of education. In addition, although Hispanic males do

Table 2 Median earnings in 1990 by education (years of school completed) for white, black, and Hispanic, male and female full-time workers

	MALES		
Education level	White	Black	Hispanic
8 Years or less	16,906	16,961	13,913
9–11 Years	21,048	16,778	17,868
12 Years	26,526	20,271	20,932
Some college	31,336	25,863	26,380
College degree	28,263	30,532	33,074
Graduate	47,787	36,851	42,315

	FEMALES		
Education level	White	Black	Hispanic
8 Years or less	11,826	11,364	11,231
9–11 Years	14,010	13,643	12,586
12 Years	17,552	16,531	16,298
Some college	21,547	19,922	20,881
College degree	26,822	26,881	22,555
Graduate	31,991	31,119	30,133

(Source. US Bureau of the Census 1991)

better than their black peers at the higher levels of education, the same is not true for Hispanic females. These data indicate that simply equalizing levels of education would still leave a large racial gap in earned income.

Dressler (1993) also indicates that the pattern of income production varies for black and white households. Black households are more likely than white ones to rely on several wage earners to contribute to total household income. Middle class blacks are also more likely than their white peers to be recent and tenuous in that class status (Collins 1983). College-educated blacks, for example, are almost four times more likely than their white peers to experience unemployment (Wilhelm 1987). Researchers have also emphasized that the purchasing power of a given level of income varies by race (Cooper 1984, King & Williams 1995), with blacks paying higher prices than whites for a broad range of goods and services in society, including food and housing. African Americans also have higher rates of unemployment and underemployment than do whites. Moreover, employed blacks are more likely than their white peers to be exposed to occupational hazards and carcinogens, even after adjusting for job experience and education (Robinson 1984).

Second, racism can restrict access to the quantity and quality of health-related desirable services such as public education, health care, housing, and recreational facilities. Recent studies have found a positive association between residential segregation and mortality rates for both adults (Polednak 1993) and infants (LaVeist 1989, Polednak 1991). The relationship between segregation and infant mortality exists for blacks but not for whites. A recent review of racial differences in medical care found that even after adjusting for severity of illness, SES and/or insurance status, blacks are less likely to receive a wide range of medical services than are whites (Council on Ethical and Judicial Affairs 1990).

Third, the experience of racial discrimination and other forms of racism may induce psychological distress that may adversely affect physical and mental health status, as well as the likelihood of engaging in violence and addiction. Recent reviews reveal that a small but growing body of evidence indicates that the experience of racial discrimination is adversely related to a broad range of health outcomes (Kreiger et al 1993, Williams et al 1994). In addition, the internalization of racist ideology is also adversely associated with morbidity (Williams et al 1994).

In color conscious American society, skin color may be an important determinant of the degree of exposure to racial discrimination, access to valued resources, and the intensity of the effort necessary to obtain them (Dressler 1993). Dressler (1993) has employed darker skin color as an objective indicator of low social status within the black population and found that status inconsistency based on the relation of skin color to life-style (ownership of material goods and engaging in status enhancing behaviors) is associated with elevated rates of hypertension. Independent of education level, persons with darker skin color and higher life-style had the highest levels of blood pressure. Klag et al (1991) also found an interaction between skin color and SES in a sample of blacks. Darker skin color was associated with elevated rates of hypertension for low but not high SES blacks. Consistent with the notion that darker skinned African Americans may experience higher levels of discrimination, analyses of data from the National Study of Black Americans found that skin color was a stronger predictor of occupational status and income of blacks than was parental SES (Keith & Herring 1991).

Age may be a proxy for the cumulative exposure to racism and adverse living conditions. There is an intriguing age patterning of at least some of the racial disparities in health. For both obesity and high blood pressure, racial differences are absent in childhood but emerge in early adulthood (Williams 1992, Kumanyika 1987). Similarly, neonatal mortality rates increase with age of the mother from the teens through the twenties for blacks and Puerto Ricans, while an opposite pattern is evident for whites and Mexican Americans (Geronimus 1992). These patterns may reflect a lagged effect of environmental exposure or a marked change in health status, as young adults are forced to confront restricted socioeconomic opportunities and truncated options (Williams 1992). Geronimus (1992) has proposed a "weathering hypothesis" to account for this pattern: for disadvantaged populations, age is a proxy for chronic exposure to adverse living conditions, with older age reflecting cumulative exposure to environmental assaults and the consequent increase in biological vulnerability.

Acculturation

The health profile of the Hispanic population in general and Mexican Americans in particular has seriously questioned the dominant paradigm that focuses heavily on SES and medical care as key explanatory factors for racial differences in health. Although Mexican Americans are low in SES and have low rates of health insurance, utilization of medical care and preventive health care, they have rates of infant mortality, overall mortality, and many chronic illnesses that are lower than those of African Americans and comparable to those of Anglos (Furino 1992). Moreover, several recent studies have noted that unlike the pattern for other racial groups, SES is unrelated to health outcomes such as blood pressure and low birth weight for Mexican Americans or foreign-born Mexican Americans (e.g. Sorel et al 1992, Collins & Shay 1994). It is unclear whether this pattern reflects a healthy immigrant effect, protective effects of host cultures, or differences in the historical time period across societies in the secular distribution of disease. For example, SES has opposite effects in the earlier versus the later periods of the heart disease epidemic. A role for acculturation is suggested by the fact that foreign-born Hispanics have a better health profile than do their counterparts born in the United States. Rates of infant mortality, low birth weight, cancer, high blood pressure, adolescent pregnancy, and psychiatric disorders increase with length of stay in the United States (Vega & Amaro 1994). Migration studies of the Chinese and Japanese show that rates of some cancers such as prostate and colon increase when these populations migrate to the United States, while the rates of other cancers such as liver and cervix decline (Jenkins & Kagawa-Singer 1994).

It has been hypothesized that the cultural factors resident in traditional Mexican culture enhance the health of Mexican immigrants (James 1993). However, exactly what these protective cultural symbols, attitudes, or experiences are has not been clearly identified. As groups migrate from one culture to another, immigrants often adopt the diet and behavior patterns of the new culture. At the same time the transition to a new culture can also generate stress that may have adverse consequences for health. Several behaviors that adversely affect health status increase with acculturation. These include decreased fiber consumption, decreased breast feeding, increased use of cigarettes and alcohol especially in young women, driving under the influence of alcohol, and the use of illicit drugs (Vega & Amaro 1994). Acculturation also brings declines in caloric intake and fat, and reduced rates of diabetes and obesity.

Earlier studies of acculturation and heart disease among the Japanese immigrants to the United States provide a useful model for identifying and studying the health consequences of different aspects of culture (Marmot & Syme 1976). Rogler et al (1991) have also outlined directions for improvement in the conceptualization and measurement of acculturation and for assessing its relationship to health.

Conceptualization of Race

Researchers have recently emphasized that we need to give more attention to what race is and why it is related to health status. They emphasize that our fundamental assumptions about what race is will shape the research questions developed to understand racial disparities in health (Dressler 1993, Krieger et al 1993, King & Williams 1995, Williams et al 1994). Historically, explanations for differences in health between the races focused on biological differences between racial groups. The biological approach views racial taxonomies as meaningful classifications of genetic differences between human population groups. The available scientific evidence shows that such a view of race is seriously flawed. Our current racial categories do not capture biological distinctiveness. Racial groups are more alike than different in terms of biological characteristics and genetics, and no specific scientific criteria distinguish different racial groups. Williams et al (1994) note that unlike the social sciences, medicine and epidemiology have been slower in rejecting the now scientifically discredited biological view of race. They argue that an emphasis on biological sources of racial variations in health are least threatening to the status quo. Biological explanations focus on factors that reside within the individual and develop solutions that target individuals. They can effectively divert attention from current societal arrangements and policies that shape the health status of population groups.

Diseases that have a clear genetic component account for only a tiny part of racial disparities in health. For example, sickle cell anemia in African Americans accounts for three tenths of one percent of the total number of excess deaths in the black population (Cooper 1984). Thus, racial differences in biology are not the primary cause of racial variations in health and disease. Although the genetic contribution to racial variations in health status is likely to be small, researchers should be attentive to interactions between biological variables and environmental ones.

Studies that have examined the ways in which race is used in health and medical research document that race and ethnicity are widely used in the health literature to stratify or adjust results and to describe the sample or population of the study (Jones et al 1991, Williams 1994). However, the terms used for race are seldom defined, and race is frequently employed in a routine and uncritical manner to represent ill-defined social and cultural factors. Researchers seldom specify how race is measured. A more deliberate, purposeful, and theoretically informed explication of race is needed (Williams 1994). Race is a proxy for specific historical experiences and a powerful marker of current social and economic conditions that determine exposure to pathogenic factors. Advances in our understanding of the role of race in health are contingent on efforts to directly assess the critical aspects of race that are implicated in health outcomes.

Problems with Racial Data

There is growing awareness of serious reliability and validity problems with the measurement of race and ethnicity (Hahn 1992). One study of a large national population found that fully one third of the US population reported a different racial or ethnic status one year after their initial interview (Johnson 1974). There is also considerable discrepancy, especially for American Indians, Hispanics, and APIAs, between interviewer-observed race and respondent self-report. Massey (1980) found, in a large national sample, that 6% of persons who reported themselves as black, 29% of self-identified APIAs, 62% of self-identified American Indians, and 80% of persons who self-identified with an "other" category (70% of whom were Hispanic) were classified by the interviewer as white. Given that racial status on death certificates is typically based on observer identification, the undercount problem in the numerator for mortality rates may be especially acute for some minority populations. Variations in the classification of race by different administrative systems can affect reported rates of health conditions, and this has also emerged as a major concern (Hahn 1992).

The implications of census undercount for the quality of health data for racial and ethnic populations have also been receiving increasing attention (Williams et al 1994, Notes & Comments 1994). Census data are routinely used to construct sampling frames for population-based epidemiologic studies, to adjust obtained samples for nonresponse, and to calculate denominators for mortality and selected morbidity rates. Any rate that uses an undercounted denominator is overestimated in exact proportion to the undercount in the denominator. For all five-year age groups of black men ages 30–54, the estimated net undercount is almost 20%. Estimates of undercount based on demographic analysis are only available at the national level, and rates are probably even higher in selected geographic areas.

There is growing awareness that the Latino, APIA, and Native American populations are characterized by considerable heterogeneity in sociodemographic characteristics as well as the distribution of disease and risk factors for disease (Vega & Amaro 1994, Zane et al 1994). Failure to attend to the variations in health indicators within a racial category can prevent the identification of health needs for some specific groups. Increasing attention has also been given to the heterogeneity of the black population (Williams et al 1994). The major white ethnic groups are also characterized by distinctive histories and cultures, but little recent attention has been given to exploring ethnic variations in health for the non-Hispanic white population.

The classification of persons of mixed racial parentage is a significant issue facing data collection agencies, and American society more generally. The numbers of interracial couples and children from these unions have been increasing steadily over time. The health risks associated with multiracial status have not been systematically studied. Morton et al (1967) studied the birth weight of infants of mixed race in Hawaii and found that such infants had birth weights intermediate between those of their parents' racial groups. A recent study suggests that the relationship between multiracial status and health may be complex, e.g. infants born to black mothers and white fathers were more likely to be low in birth weight than those born to white mothers and black fathers (Collins & David 1993).

The noncoverage of selected racial/ethnic subgroups in population-based epidemiologic surveys is a matter of continuing concern. In addition to precluding our understanding of the distribution of disease in certain populations, the unavailability of data also has policy implications. For example, due to the lack of baseline data, there were fewer objectives in Healthy People 2000 for the APIA population than for any other racial group (Chen MS 1993). Healthy People 2000 is a national health planning initiative that has defined a set of measurable health targets to improve the health status of the American population by the year 2000. Because it has increasingly become a basis for the allocation of funds to support public health programs, lack of objectives can importantly determine the distribution of economic resources.

MECHANISMS UNDERLYING SES AND RACIAL DIFFERENCES IN HEALTH

Research on the determinants of health has suggested that a broad range of factors such as stress in family home and work environments, health practices, social ties, and attitudinal orientations are important determinants of health. Typically, inadequate attention is given to the ways in which the social distribution of risk factors and resources for health is constrained by societal norms and structures. A growing body of evidence suggests that risk factors for health outcomes are related to SES and race (Mirowsky & Ross 1989, Williams 1990, House et al 1990; 1994). The distribution of risk factors and resources are shaped by the conditions under which people live and work. Researchers should also be attentive to interactions between social status and risk factors because evidence suggests that comparable stressful events, for example, have stronger negative effects on lower SES persons than on those of higher status (Kessler 1979).

Medical Care

Inadequate use of medical care, especially preventive medical care, by the poor and members of racial/ethnic minority populations is generally viewed as an important determinant of their health status. There are racial and socioeconomic status differences in the quantity and quality of medical care (e.g. Blendon et al 1989). A study of deaths of blacks and whites in Alameda County, California (Woolhandler et al 1985) found that deaths due to causes amenable to medical intervention accounted for about one third of the excess total death rate of blacks relative to whites. Recent reviews of the evidence on the contribution of medicine to health status indicate that the role of medicine is frequently overstated and that the removal of economic barriers alone will not eliminate social disparities in health care utilization (Williams 1990, Adler et al 1993).

However, equitable access to medical care is important and crucial to preventing further deterioration of the health status of disadvantaged populations (Williams 1990). For many disease conditions such as cancer, tuberculosis, and hypertension, the higher incidence rates among African Americans do not account for the higher mortality rates (Schwartz et al 1990). The higher mortality rate may result from later initial diagnosis of disease, comorbidity, delays in treatment, or other gaps in the quality of care. Thus, preventive medical care, appropriate early intervention in the course of an illness, and medical management of chronic disease can play important roles in enhancing the quantity and quality of life. Some evidence indicates that medical care has a greater impact on the health status of vulnerable racial and low SES groups than on their more advantaged counterparts (Williams 1990). For disadvantaged groups faced with multiple deficits, medical care may be a critical health-protective resource, while the incremental contribution of medicine is more limited for groups that already enjoy many social advantages.

Health Behavior

Health behaviors are important determinants of health. A US Surgeon General's Report indicated that unhealthy behavior or life-style account for half of the annual number of deaths in the United States (US Department of Health, Education & Welfare 1979). In comparison, 20% are due to environmental factors, 20% to genetics, and 10% to inadequate medical care. Health practices such as better nutrition and eating habits, diminished tobacco, alcohol, and drug abuse, and more exercise can dramatically improve health. The federal report on black and minority health (US Department of Health and Human Services 1985) also identified health behaviors as the major determinants of the excess levels of mortality in minority populations in the United States.

Cigarette smoking is responsible for more than one in six deaths annually in the United States, for a total of 430,000 deaths (VW Chen 1993). A growing body of evidence suggests that smoking is increasingly concentrated among the lowest socioeconomic groups and minority populations. The prevalence of smoking is higher for black and Hispanic men than for whites. There is a paradox to black rates of smoking. Compared to whites, African American smokers start smoking later and smoke fewer cigarettes per day, but they are more adversely affected by smoking (Sterling & Weinkam 1989). In particular, there has been a sharper rise in lung cancer incidence among blacks than whites. Part of this difference may reflect differences in occupational exposures (Sterling & Weinkam 1989). A much greater proportion of blacks than whites work in occupations where they are exposed to occupational hazards such as toxic chemicals, dust, and fumes. Another factor accounting for this difference is the tendency for blacks to smoke cigarettes with higher tar content than those smoked by whites. More than 75% of black smokers use high tar cigarettes compared to 56% of whites and 69% of other races. Blacks are also three times more likely than other groups to smoke menthol cigarettes (VW Chen 1993). In general, blue collar and service workers are more likely to smoke nonfilter cigarettes than are professional managerial workers, and blacks are disproportionately represented in the former category.

Working Conditions

In one of the earliest sociological treatises on the association between social class and health, Engels ([1844] 1984) noted that the average longevity of the upper classes in Liverpool in 1840 was 35 years, compared to 22 years for business men and better-placed craftsmen, and only 15 years for operatives and day-laborers. He identified conditions of work including machine-paced employment, long hours, exposure to dust, fumes, other bad atmospheric conditions, and having to maintain uncomfortable body positions as major mechanisms responsible for excess mortality. Most recent US studies utilize income and education as indicators of SES and neglect the role of occupational conditions. Low SES persons are more likely to be employed in occupational settings where there is an elevated risk of exposure to toxic substances and bad working conditions, but the role of occupational conditions tends to be neglected. Moore & Hayward (1990) is an exception to this pattern. They used data from the NLS and found that the aspects of the occupational environment that accounted for the association between occupation and mortality varied with the occupational indicator utilized. For longest occupation, the substantive complexity of the job (routinization and autonomy) is the major factor, while social skills and physical and environmental demands are the major factors accounting for the effects of the most recent occupation. In a study of over 5613 persons aged 15–75 in Sweden, Lundberg (1991) found that the physical working conditions were the major source of SES differences in physical illness, although economic hardship during upbringing and health-related behaviors also played a role. Bad working conditions were defined as heavy work, and daily contact with poisons, dust, smoke, acid, explosives, vibration, and the like.

Environmental Exposure

Concerns have also been raised about the extent to which low SES persons in general and racial minorities in particular are disproportionately exposed to environmental risks in residential environments. One early study found that treatment, storage, and disposal of hazardous waste sites were disproportionately located in areas where the surrounding residential population was black, and a study by the United Church of Christ (Commission for Racial Justice 1987) found that race was the strongest predictor of the location of hazardous waste sites in the United States. However, a recent industry-funded national study found that there is no significant relationship between the racial or ethnic composition of census tracts, and the presence of commercial hazardous waste facilities (Anderton et al 1994).

The Economy and Health

Brenner (1995) has recently reviewed the evidence linking changes in the economy to health status. Rates of suicide and admissions to psychiatric hospitals increase during economic recessions. Cirrhosis mortality increases substantially one to two years after a national economic recession. Instructively, it is the consumption of distilled spirits, rather than wine or beer, that is a significant factor in the increase in cirrhosis mortality. Blacks are estimated to purchase half of all the rum sold in the United States, 41% of the gin, 50% of scotch whiskeys, and 77% of Canadian whiskeys (Djata 1987).

In Britain, higher mortality rates are also found for the unemployed compared to the employed (Brenner 1995). The wives of unemployed men had higher mortality rates during the follow-up period in some studies. This literature also indicates that economic stress induces divorce and separation in families, and adversely impacts friendship networks.

Personality

A number of personality variables have emerged as major risk factors for health status or as buffers or moderators of the impact of stressful experiences on health. These include self-esteem, perceptions of mastery or control, anger or hostility, feelings of helplessness and hopelessness, and repression or denial of emotions (Kessler et al 1995). The distribution of at least some health-enhancing personality characteristics varies by SES (Williams 1990, Mirowsky & Ross 1989), and future research must seek to identify the ways in which individual dispositions are shaped by the larger social context. Research on John Henryism illustrates the interaction between personality characteristics and socioeconomic status (James 1994). The John Henryism scale measures an active predisposition to master stress. Research with this measure suggests that John Henryism acts to increase blood pressure among lower SES blacks while simultaneously decreasing it among their higher SES black counterparts. It is interesting that the limited evidence available indicates that John Henryism is unrelated to blood pressure in whites.

Early Life Conditions

Most studies of SES and racial differences in health focus on current socioeconomic status. However, an adult's health status is a function not only of current SES but of the SES conditions experienced over the life course (Williams 1990, Mare 1990). Elo & Preston (1992) have provided a comprehensive review of the evidence suggesting that early life socioeconomic and health conditions have long-term consequences for an adult's health status. Several mechanisms appear to be at work. It appears that some diseases acquired in childhood, such as tuberculosis and typhoid, can be harbored for decades and manifest themselves later in life. Infection with the Hepatitis B virus can impair liver functioning and lead to cirrhosis of the liver and liver cancer. Living in a crowded household can increase one's risk of streptococcal infection and acute rheumatic fever, which in turn become major risk factors for rheumatic heart disease later in life. Infection plays a major role in growth retardation, and malnutrition as reflected in height may adversely affect the immune system. Diarrhea in childhood can also affect child growth.

In other instances a childhood disease may impair an individual's organ system, which can create a chronic debility that leads to worse health status and earlier mortality. Some childhood illnesses and conditions can lead to changes in adult health status. Nutritional intake in childhood and exposure to and host resistance to infections play a major role in determining adult height. Respiratory tract infections in childhood as well as height (a proxy for early environmental influences) are related to the development of chronic bronchitis, asthma, and emphysema in adulthood. Several studies have also noted an association between height and mortality. Shorter persons have higher mortality rates than do their taller counterparts. However, some of these connections between height and adult mortality can be linked indirectly through SES status achieved in adulthood. There is a positive relationship between height and SES.

There is growing evidence that conditions related to the intrauterine environment during the fetal period and/or patterns of behavior acquired in early childhood are major risk factors for cardiovascular disease in adulthood (Elo & Preston 1992). Several of these factors appear to have direct relevance for the health status of the African American population. For example, some studies have found that growth retardation during the fetal period or low birth weight is associated with high blood pressure in later life. Rates of low birth weight are twice as high for African Americans as for whites, and low birth weight is believed to be a crude indicator of growth retardation.

Using infant weight up to age one as a proxy for nutritional deprivation in early childhood, a study of over 5000 British boys documented a strong association between nutritional deprivation in childhood and heart disease in adulthood (Barker et al 1989). Death rates for heart disease were 2.6 times higher for those in the lowest weight category at age one than for those in the highest category. Interestingly, breast-fed children were also at lower risk of heart disease. Breast-feeding is positively associated with SES, and blacks are less likely to breast-feed than whites; rates of breast-feeding also decline for Hispanic and Asian immigrants with assimilation (Jeffrey 1993). Infant formula companies aggressively market their product to low income and minority women, who may be less aware of the benefits of breast-feeding, and the WIC program (a federal program that provides nutritional support to poor women) accounts for 40% of the sale of infant formula in the United States (Jeffrey 1993).

Power

The proliferation of studies of socioeconomic status and health needs to be placed within an appropriate framework to enhance our understanding of the underlying dynamics. Some studies tend to reify the categories of SES such as education or income by addressing what it is about these specific factors that are linked to health outcomes. Rather, SES measures are crude indicators of location in social structure. A return to the sociological construct of social class can serve to inform and structure our understanding of inequalities in health. Social classes are hierarchically arranged, socially meaningful groupings linked to the structure of society. Systematic inequality will flow from membership in one class rather than another. The Marxist view of class, in particular, emphasizes that antagonistic and contradictory relations would exist between classes as they mobilize and struggle over economic and political power. Class membership leads to differential political and economic power, and inequality in power is a neglected but important construct for enhancing our understanding of the consequences of class for health (Packham 1991).

Power is differentially distributed in society, and location in social structure determines the degree of power and influence that social groups have with regard to the decisions that have a differential impact on all members of society. Good health status is one product of the power of the class to which one belongs. The power of social classes in a given community can be inferred from an analysis of which groups occupy important institutional positions, who takes part in important decisions made over private and public issues, and ultimately who benefits or is harmed by these decisions and policies (Packham 1991). Packham (1991) illustrates this process in the case of the location of hazardous waste sites and hazardous production. Similarly, Brenner (1995) argues that because of blue collar workers' relative lack of power (knowledge of occupational health risks and political influence to change their work environments) they are less able to affect the development of occupational safety and health codes. Also, Rice & Winn (1990) emphasize that those with the most power and influence have greater impact on decision-making and the allocation of benefits for themselves. Groups with less influence are less competitive in policy and decision-making processes, and therefore they experience inequities in a broad range of societal outcomes linked to this deficit in power. Rice & Winn argue that governmental involvement and advocacy are necessary to reduce the natural tendency for the higher social classes to exert greater control and extract greater benefit from the allocation and distribution of valued benefits and services.

The concept of power along with the related concept of control can serve to integrate major findings in the literature on inequalities in health and point to promising directions for future research. LaVeist (1992) found a strong inverse relationship between black political power and post-neonatal mortality rates, and outlines some pathways through which political empowerment may enhance health. Syme (1991) also indicates that control may be the key determinant of the SES gradient in health. He argues the effects of social support, Type A behavior, and stressful life events can all be interpreted to reflect the presence or absence of different aspects of control (Syme 1991). Other evidence suggests that the ability to understand, predict, and control daily life experiences can determine both the level of stress to which persons are exposed and the impact of stress on them (Sutton & Kahn 1987). Control may facilitate the management of uncertainty, which can be a key determinant of the stressfulness of many social situations. Lack of control in occupational environments has also been shown to predict increased risks of disease (Karasek & Theorell 1990).

Differences in power may also undergird the greater awareness of health risks by higher SES persons and their greater responsiveness to health education campaigns. Coleman (1974) indicates that access to and control of valuable information in society is a key manifestation of power. High SES persons are among the first to be exposed to new information and have the necessary economic and other resources to capitalize on new information and to develop alternatives to behaviors that have been shown to be health damaging.

ARE INEQUALITIES IN HEALTH INEVITABLE?

International comparisons of inequality in health and trends in social inequalities over time provide compelling data to address the issue of reducing health inequalities. National mortality rates are not strongly related to a country's overall economic status but are closely linked to the level of inequality within each country (Wilkinson 1992b). Countries with the least inequality have the best health profiles (Smith et al 1990, Wilkinson 1992a). Differences in income distribution alone account for two thirds of the variation in national mortality rates for the 23 countries belonging to the Organization for Economic Cooperation and Development. Trends in income inequality are also related to SES variations in health over time within a given country. An analysis of SES differences in mortality in England and Wales between 1921 and 1981 revealed that they widened or narrowed to correspond with increases or decreases in relative poverty (Wilkinson 1989).

A study of the relationship between education and mortality in nine industrialized countries also suggests that a country's level of egalitarian social and economic policy is linked to the nature of SES differentials in health within that country. Inequalities in mortality were twice as large in the United States, France, and Italy as in the Netherlands, Sweden, Denmark, and Norway (Kunst & Mackenbach 1994). Finland, England and Wales occupied intermediate positions. Vagaro & Lundberg (1989) have shown that the lowest social classes in Sweden have lower mortality than the highest social classes in Great Britain. Thus, the benefits of income redistribution within a society may affect the health status of the majority of the population.

A clear illustration of the link between economic inequality and health is found in the comparison of the trends in life expectancy and income for Japan and Great Britain over the past two decades (Wilkinson 1992a). In 1970, Japan and Great Britain were similar in average life expectancy and income distribution. During the last two decades SES differentials in Japan became the narrowest in the world, while the income distribution widened in Great Britain. During this same period Japan's life expectancy rapidly increased to become the highest in the world while Britain's relative international ranking in life expectancy has declined. Changes in Japanese nutrition, health services, or prevention policies do not account for these differences (Marmot & Smith 1989).

Further evidence that the health status disadvantage of low SES groups is not driven by an absolute standard of economic well-being comes from comparisons of the African American population in the United States with their counterparts in the Caribbean. Although the average annual income in Barbados is under US $3000, life expectancy among black men in Barbados was 71 years in 1988, while it was 65 years for black men in the United States. Infant mortality in Barbados was similar to that of US blacks—19 per 1000 live births (Cooper 1993).

The evidence is fairly clear that reductions in inequalities in health are closely linked to reductions in societal inequality. Factors such as medical care, even if equally provided to all, are unlikely to diminish SES differentials. Improved access to health enhancing resources may improve health for both high and low social status groups without reducing the health disparity between them. Reducing the SES gradient in health will require more fundamental changes. Freeman (1993) suggests that Third World communities in the United States (geographically and culturally defined areas of extreme excess mortality) should be identified and designated as chronic disaster areas. Special federal, state, and local resources should then be provided to such designated areas as is done in the case of natural disasters. Conditions such as substandard housing, low educational levels, poor social support and unemployment, as well as insufficient access to preventive health services should then be improved.

Income is probably the component of SES that is most amenable to change through redistributive policies such as tax credits or direct income supplementation. Two studies have documented that changes in household income can enhance health. In a study of expanded income support, Kehrer & Wolin (1979) found that the birth weight of the infants of mothers in the experimental income group was higher than those of mothers in the control group, although neither group experienced any experimental manipulation of health services. Improved nutrition, probably a result of the income manipulation, appeared to have been the key intervening factor. Similarly, Wilkinson (1990) found in analysis of mortality over a ten-year period that changes in the proportion of workers with low earnings in specific occupational categories were significantly associated with changes in occupational mortality.

CONCLUSION

One of sociology's most enduring contributions to the health field is the documentation that social class position is a key determinant of variations in the distribution of disease. Researchers in diverse disciplines recognize that SES is so strongly linked to health that they must statistically control for it in order to study their phenomena of interest. However, familiarity has bred complacency, and an opportunity exists for sociologists to provide leadership and direction to enhance understanding of the pathways by which social structure affects health.

The evidence reviewed indicates that large-scale societal factors are the primary determinants of health status. They determine not only the social categories to which people are assigned but their exposure to risk factors and resources. However, the ways in which location in social structure constrains and shapes daily life experiences in ways that adversely affect health is not well understood. Studies that seek to identify these pathogenic factors and mechanisms are urgently needed. Research on racism, acculturation, and power are fruitful places to begin. However, research and policy aimed at understanding the determinants of, and ensuring improvements in, health must recognize that intervening mechanisms and risk factors can be understood and effectively modified only in the context of the larger social environment in which they occur. For example, the high levels of low birth weight among African Americans are regarded as the prime risk factor for elevated rates of infant mortality. However, the mean birth weight for blacks in the United States is similar to that in Japan—but Japan has the lowest rate of infant mortality in the world (Wise & Pursley 1993). Not surprisingly, the available evidence indicates that interventions aimed at altering known risk factors without addressing fundamental social causes have had very limited success (Syme 1994). Thus, improvement in the health of vulnerable populations appears to be contingent on altering the fundamental macrosocial causes of inequalities in health.

Racial and socioeconomic inequality in health is arguably the single most important public health issue in the United States. The evidence reviewed indicates that SES inequalities in health are widening, and the health status of at least some racial groups has worsened over time. The ranking of the United States relative to other industrialized countries in terms of health has been declining over time, while America continues to spend more on medical care per capita than any other country in the world. The evidence reviewed suggests that a serious and sustained investment in reducing societal inequalities can enhance the quantity and quality of life of all Americans and create the necessary liberty for the pursuit of health and happiness.

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Literature Cited

Adler NE, Boyce T, Chesney MA, Folkman S, Syme SL. 1993. Socioeconomic inequalities in health: no easy solution. *J. Am. Med. Assoc.* 269:3140–45

Adler NE, Boyce T, Chesney MA, Cohen S, Folkman S, et al. 1994. Socioeconomic status and health: the challenge of the gradient. *Am. Psychol.* 49:15–24

Anderton DL, Anderson AB, Oakes JM, Fraser MR. 1994. Environmental equity: the demographics of dumping. *Demography* 31:229–48

Antonovsky A. 1967. Social class, life expectancy and overall mortality. *Milbank Q.* 45:31–73

Arber S. 1987. Social class, non-employment and chronic illness· continuing the inequalities in health debate. *Br. Med. J.* 294:1069–73

Arber S. 1991. Class, paid employment and family roles: making sense of structural disadvantage, gender and health status. *Soc Sci. Med.* 32:425–36

Baquet CR, Horm JW, Gibbs T, Greenwald P. 1991. Socioeconomic factors and cancer incidence among blacks and whites. *J. Natl. Cancer Inst.* 83:551–57

Barker DJP, Osmond C, Winter PD, Margetts B, Simmonds SJ. 1989. Weight in infancy and death from ischaemic heart disease. *Lancet* 9:578–80

Baxter J. 1994. Is husband's class enough? Class location and class identity. *Am. Sociol. Rev.* 59:220–35

Blendon R, Aiken L, Freeman H, Corey C. 1989. Access to medical care for black and white Americans. *J. Am. Med. Assoc.* 261:278–81

Braithwaite RL, Taylor SE. 1992. *Health Issues in the Black Community.* San Francisco: Jossey-Bass

Brenner MH. 1995. Economy, society, and health: theoretical links and empirical relations. In *Society and Health: Foundation for a Nation*, ed. S Levine, DC Walsh, BC Amick, AR Tarlov. New York: Oxford Univ. Press. In press

Bunker JP, Gomby DS, Kehrer BH, eds. 1989. *Pathways to Health: The Role of Social Factors.* Menlo Park, CA: Kaiser Family Found.

Carstairs V, Morris R. 1989. Deprivation and mortality: an alternative to social class? *Commun. Med.* 11:210–19

Castro KG. 1993. Distribution of acquired immunodeficiency syndrome and other sexually transmitted diseases in racial and ethnic populations, United States: influences of life-style and socioeconomic status. *Ann. Epidemiol.* 3:181–4

Chen MS. 1993. A 1993 status report on the health status of Asian Pacific Islander Americans: comparisons with *Healthy People 2000* objectives. *Asian Am. Pacific Islander J. Health* 1:37–55

Chen VW. 1993. Smoking and the health gap of minorities. *Ann. Epidemiol.* 3:159–64

Coleman JS. 1974. *Power and the Structure of Society.* New York: Norton

Collins JW Jr, David RJ. 1993. Race and birthweight in biracial infants. *Am. J. Pub. Health* 83:1125–29

Collins JW Jr, Shay DK. 1994. Prevalence of low birth weight among Hispanic infants with United States–born and foreign-born mothers: the effect of urban poverty. *Am. J. Epidemiol.* 139:184–92

Collins SM. 1983. The making of the black middle class. *Soc. Prob.* 10:369–82

Commission for Racial Justice. 1987. *Toxic Wastes and Race in the United States: A National Report on the Racial and Socioeconomic Characteristics of Communities with Hazardous Waste Sites.* New York: United Church of Christ

Cooper R. 1984. A note on the biological concept of race and its application in epidemiologic research. *Am. Heart J.* 108: 715–23

Cooper RS. 1993. Health and the social status of blacks in the United States. *Ann. Epidemiol.* 3:137–44

Cooper RS, Steinhauer M, Schatzkin A, Miller W. 1981. Improved mortality among U.S. blacks, 1968–78: the role of antiracist struggle. *Int. J. Health Serv.* 11:511–22

Council on Ethical and Judicial Affairs, American Medical Association. 1990. Black-white disparities in health care. *J. Am. Med. Assoc.* 263:2344–46

Crews DE. 1994. Obesity and diabetes. In *Confronting Critical Health Issues of Asian and Pacific Islander Americans*, ed. NWS Zane, DT Takeuchi, KNJ Young, pp. 174–208. Thousand Oaks, CA: Sage

Curtin PD. 1992. The slavery hypothesis for hypertension among African Americans: the historical evidence. *Am. J. Pub. Health* 82: 1681–86

Danziger S, Gottschalk P, eds. 1993. *Uneven Tides: Rising Inequality in America.* New York: Russell Sage

Davis RM. 1987. Current trends in cigarette advertising and marketing. *New Engl. J. Med.* 316:725–32

Department of Health and Social Security. 1980. *Inequalities in Health: Report of a Research Working Group* (The Black Report). London: Dep. Health Soc. Security

Djata. 1987. The marketing of vices to black consumers. *Bus. Soc. Rev.* 62:47–49

Dohrenwend B. 1990. Socioeconomic status (SES) and psychiatric disorders. *Soc. Psychol. Psychiatr. Epidemiol.* 25:41–47

Dressler WW. 1993. Health in the African American community: accounting for health inequalities. *Med. Anthropol. Q.* 7:325–45

Duleep HO. 1989. Measuring socioeconomic mortality differentials over time. *Demography* 26:345–51

Duncan G. 1988. The volatility of family income over the life course. In *Life Span Development and Behavior,* Vol. 9, ed. P Bates, D Featherman, R Lerner, pp. 317–58. Hillsdale, NJ: Lawrence Erlbaum Assoc.

Duncan GJ, Brooks-Gunn J, Klebanov PK. 1994. Economic deprivation and early childhood development. *Child Dev.* 65:296–318

Duncan GJ, Smeeding T, Rodgers W. 1993. W(h)ither the middle class?: a dynamic view. In *Poverty and Prosperity in the USA in the Late Twentieth Century*, ed. D Papadimitriou, E Wolff, pp. 240–271. London: MacMillan

Eller TJ. 1994. *Household Wealth and Asset Ownership: 1991. US Bureau of the Census, Current Population Reports, P70–34.* Washington DC: US Govt. Printing Off. (USGPO)

Ellis L, ed. 1993. *Social Stratification and Socioeconomic Inequality,* Vol. 1. Westport, CT: Praeger

Elo IT, Preston SH. 1992. Effects of early-life conditions on adult mortality: a review. *Pop. Index* 58:186–212

Engels F. 1984. [1844] *The Condition of the Working Class in England.* Chicago: Academy Chicago

Feinstein JS. 1993. The relationship between socioeconomic status and health. *Milbank Q.* 71:279–322

Feldman JJ, Makuc DM, Kleinman JC, Cornoni-Huntley J. 1989. National trends in educational differentials in mortality. *Am. J. Epidemiol.* 129:919–33

Fingerhut LA, Makuc DM. 1992. Mortality among minority populations in the United States. *Am. J. Pub. Health* 82:1168–70

Fox A, Goldblatt PO, Jones DR. 1985. Social class mortality differentials: artefact, selection or life circumstances? *J. Epidemiol. Commun. Health* 39:1–8

Freeman HP. 1993. Poverty, race, racism, and survival. *Ann Epidemiol.* 3:145–49

Furino A, ed. 1992. *Health Policy and the Hispanic.* Boulder: Westview

Gabarino J, Dubrow N, Kostelney K, Pardo C. 1992. *Children in Danger: Coping with the Consequences of Community Violence.* San Francisco: Jossey-Bass

Geronimus AT. 1992. The weathering hypothesis and the health of African-American women and infants: evidence and speculations. *Ethnicity & Disease* 2:207–21

Goldblatt P. 1990. *Longitudinal Study: Mortality and Social Organisation.* London: HMSO

Greenberg M, Schneider D. 1994. Violence in American cities: young black males is the answer, but what was the question? *Soc. Sci. Med.* 39:179–87

Haan MN, Kaplan AG. 1986. The contribution of socioeconomic position to minority health. In *Report of the Secretary's Task Force on Black and Minority Health,* 2:69–103. Washington, DC: US Dep. Health Hum. Serv.

Haan M, Kaplan G, Camacho T. 1987. Poverty and health: prospective evidence from the Alameda County Study. *Am. J. Epidemiol.* 125:989–98

Hahn RA. 1992. The state of federal health statistics on racial and ethnic groups. *J. Am. Med. Assoc.* 267:255–58

Harburg E, Erfurt J, Chape C, Havenstein L, Scholl W, Schork MA. 1973. Sociological stressor areas and black-white blood pressure: Detroit. *J. Chron. Dis.* 26:595–611

Haug M. 1977. Measurement on social stratification. *Annu. Rev. Sociol.* 3:51–77

Hauser RM. 1993. Trends in college entry among blacks, Hispanics, and whites. In *Studies of Supply and Demand in Higher Education*, ed. C Clotfelter, M Rothschild, pp. 61–119. Chicago: Univ. Chicago Press

Herd D. 1985. Migration, cultural transformation and the rise of black liver cirrhosis mortality. *Br. J. Addict.* 80:397–410

Hernandez DJ. 1993. *America's Children: Resources from Family, Government and the Economy*. New York: Russell Sage.

Hibbard J, Pope C. 1991. Effect of domestic and occupational roles on morbidity and mortality. *Soc. Sci. Med.* 32:805–11

Hogue CJR, Buehler JW, Strauss LT, Smith JC. 1987. Overview of the national infant mortality surveillance (NIMS) project: design, methods, results. *Pub. Health Rep.* 102:126–38

Holzer C, Shea B, Swanson J, Leaf P, Myers J, et al. 1986. The increased risk for specific psychiatric disorders among persons of low socioeconomic status. *Am. J. Soc. Psychiatr.* 6:259–71

House JS, Kessler RC, Herzog AR, Mero RP, Kinney AM, Breslow MJ. 1990. Age, socioeconomic status, and health. *Milbank Q.* 68: 383–411

House JS, Lepkowski JM, Kinney AM, Mero RP, Kessler RC, Herzog AR. 1994. The social stratification of aging and health. *J. Health Soc. Behav.* 35:213–34

Jackson FLC. 1991. An evolutionary perspective on salt, hypertension, and human genetic variability. *Hypertension* 17 (1, Suppl. I): 129–32

Jackson JS, Brown TN, Williams DR, Torres M, Sellers SL, Brown K. 1995. Perceptions and experiences of racism and the physical and mental health status of African Americans: a thirteen year national panel study. *Ethnicity and Disease*, 5(1). In press

James SA. 1993. Racial and ethnic differences in infant mortality and low birth weight. *Ann. Epidemiol.* 3:130–36

James SA. 1994. John Henryism and the health of African-Americans. *Culture Med. Psychiatry* 18:163–82

Jeffrey C. 1993. Formula for failure. *Chicago Reporter* 22:1,6–11

Jenkins CNH, Kagawa-Singer M. 1994. Cancer. In *Confronting Critical Health Issues of Asian and Pacific Islander Americans*, ed. NWS Zane, DT Takeuchi, KNJ Young, pp. 105–47. Thousand Oaks, CA: Sage

Johnson CE. 1974. *Consistency of Reporting Ethnic Origin in the Current Population Survey. US Dep. Commerce Tech. Pap. No. 31* Washington, DC: Bur. Census

Jones CP, LaVeist TA, Lillie-Blanton M. 1991. Race in the epidemiologic literature: an examination of the *American Journal of Epidemiology*, 1921–1990. *Am. J. Epidemiol.* 134:1079–84

Karasek RA, Theorell T 1990. *Healthy Work.* New York: Basic Books

Kehrer BH, Wolin CM. 1979. Impact of income maintenance on low birth weight: evidence from the Gary experiment. *J. Hum. Resour.* 14:434–62

Keith VM, Herring C. 1991. Skin tone and stratification in the black community. *Am. J. Sociol.* 97:760–78

Kessler RC. 1979. Stress, social status, and psychological distress. *J. Health Soc. Behav.* 20: 259–72

Kessler RC, House JS, Anspach R, Williams DR. 1995. Social psychology and health. In *Sociological Perspectives on Social Psychology*, ed K Cook, G Fine, JS House, pp. 548–70. Boston: Allyn & Bacon

Kessler RC, Neighbors HW. 1986. A new perspective on the relationships among race, social class, and psychological distress. *J. Health Soc. Behav.* 27:107–15

King G, Williams DR. 1995. Race and health: a multi-dimensional approach to African American health. In *Society and Health: Foundation for a Nation*, ed. S Levine, DC Walsh, BC Amick, AR Tarlov. New York: Oxford Univ. Press. In press

Kitagawa EM, Hauser PM. 1973. *Differential Mortality in the United States: A Study in Socioeconomic Epidemiology*. Cambridge: Harvard Univ. Press

Klag MH, Whelton PK, Coresh J, Grim CE, Kuller LH. 1991. The association of skin color with blood pressure in US blacks with low socioeconomic status. *J. Am. Med. Assoc.* 265:599–602

Kochanek KD, Maurer JD, Rosenberg HM. 1994. Why did black life expectancy decline from 1984 through 1989 in the United States? *Am. J. Pub. Health* 84:938–44

Krieger N. 1991. Women and social class: a methodological study comparing individual, household, and census measures as predictors of black/white differences in reproductive history. *J. Epidemiol. Commun. Health* 45:35–42

Krieger N, Fee E. 1994. Social class: the missing link in U.S. health data. *J Health Serv.* 24 25–44

Krieger N, Rowley DL, Herman AA, Avery B, Phillips MT. 1993. Racism, sexism, and social class: implications for studies of health, disease, and well-being. *Am. J. Prev. Med.* 9(supp.).82–122

Kumanyika SK. 1987. Obesity in black women. *Epidemiol. Rev.* 9:31–50

Kunst AE, Mackenbach JP. 1994. The size of mortality differences associated with educational level in nine industrialized countries. *Am. J. Pub. Health* 84:932–37

LaVeist TA. 1989. Linking residential segregation and infant mortality in U.S. cities. *Sociol. Soc. Res.* 73:90–94

LaVeist TA. 1992. The political empowerment and health status of African-Americans: mapping a new territory. *Am. J. Sociol.* 97: 1080–95

Levin M. 1988. The tobacco industry's strange bedfellows. *Bus. Soc. Rev.* 65:11–17

Liberatos P, Link BG, Kelsey JL. 1988. The measurement of social class in epidemiology. *Epidemiol. Rev.* 10:87–121

Lillie-Blanton M, Anthony JC, Schuster CR. 1993. Probing the meaning of racial or ethnic group comparisons in crack cocaine smoking. *J. Am. Med. Assoc.* 269:993–97

Lin-Fu JS. 1993. Asian and Pacific Islander Americans: an overview of demographic characteristics and health care issues. *Asian Pacific Islander J. Health* 1:20–36

Livingston IL. 1994. *Handbook of Black American Health: The Mosaic of Conditions, Issues, and Prospects.* Westport, CT: Greenwood

Lundberg O. 1991. Causal explanations for class inequality in health—an empirical analysis. *Soc. Sci. Med.* 32:385–93

Lurie N, Ward NB, Shapiro MF, Brook RH. 1984. Termination from Medi-Cal—does it affect health? *New Engl. J. Medicine* 311. 480–84

Mackenbach JP, Stronks K, Kunst A. 1989. The contribution of medical care to inequalities in health: differences between socio-economic groups in decline of mortality from conditions amenable to medical intervention. *Soc. Sci. Med.* 29.369–76

Mandinger MO. 1985. Health service funding cuts and the declining health of the poor. *New Engl. J. Med.* 313:44–47

Mare RD. 1990. Socio-economic careers and differential mortality among older men in the United States. In *Measurement and Analysis of Mortality—New Approaches*, ed. J Vallin, S D'Souza, A Palloni, pp. 362–87. Oxford: Clarendon

Marmot MG, Kogevinas M, Elston MA. 1987. Social/economic status and disease. *Annu. Rev. Pub. Health* 8:111–35

Marmot MG, Shipley MJ, Rose G. 1984. Inequalities in death—specific explanations of a general pattern? *Lancet* 1:1003–06

Marmot MG, Smith DG. 1989. Why are the Japanese living longer? *Br. Med. J.* 1547–51

Marmot MG, Smith GD, Stansfeld S, Patel C, North F, et al. 1991 Health inequalities among British civil servants: the Whitehall II Study. *Lancet* 337:1387–93

Marmot MG, Syme SL. 1976. Acculturation and coronary heart disease in Japanese-Americans. *Am. J. Epidemiol.* 104:225–47

Massey DS, Gross AB. 1993. Black migration, segregation, and the spatial concentration of poverty. *Irving B. Harris Graduate School of Public Policy Studies Working Paper Series: 93–3.* Univ. Chicago

Massey JT. 1980. *A comparison of interviewer observed race and respondent reported race in the National Health Interview Survey.* Presented at Ann. Meet. Am. Statis. Assoc., Houston, Texas

Maxwell NL. 1994. The effect on black-white wage differences in the quantity and quality of education. *Indust. Labor Relat. Rev.* 47: 249–64

McCord C, Freeman HP. 1990. Excess mortality in Harlem. *New Engl. J. Med.* 322:173–77

McDonough P, Duncan G, Williams DR, House JS. 1995. *Income Dynamics and Adult Mortality in the U.S., 1972–1989.* Unpublished ms. Survey Res. Ctr. Inst. for Soc. Res. Ann Arbor, MI

Miller JE, Korenman S. 1994. Poverty and children's nutritional status in the United States. *Am. J. Epidemiol.* 140:233–43

Mirowsky J, Ross CE. 1989. *Social Causes of Distress.* New York: Aldine de Gruyter

Moen P, Dempster-McClain D, Williams R. 1989. Social integration and longevity: an event history analysis of women's roles and resilience. *Am. Sociol. Rev.* 54:635–47

Moore DE, Hayward MD. 1990. Occupational careers and mortality of elderly men. *Demography* 27:31–53

Morton NE, Chung CS, Mi M-P. 1967. *Genetics of Interracial Crosses in Hawaii.* Basel, Switzerland: S. Karger

Moser KA, Pugh H, Goldblatt P. 1990. Mortality and the social classification of women. In *Longitudinal Study: Mortality and Social Organization*, Ser. LS, no. 6, ed. P Goldblatt, pp. 146–62. London: Her Majesty's Stationery Off.

Mullings L. 1989. Inequality and African-American health status: policies and prospects. In *Twentieth Century Dilemmas—Twenty-First Century Prognoses*, ed. WA VanHome, TV Tonnesen, pp. 154–182. Madison: Univ. Wisc. Inst. on Race and Ethnicity

National Center for Health Statistics. 1994a. *Health United States 1993.* Hyattsville, MD: USDHHS

National Center for Health Statistics. 1994b. *Excess Deaths and Other Mortality Measures for the Black Population: 1979–81 and 1991.* Hyattsville, MD: Pub. Health Serv.

Navarro V 1990. Race or class versus race and class: mortality differentials in the United States. *Lancet* 336:1238–40

Notes & Comments. 1994. Census undercount and the quality of health data for racial and ethnic populations. *Ethnicity & Disease* 4: 98–100

Otten MC, Teutsch SM, Williamson DF, Marks JS. 1990. The effect of known risk factors on the excess mortality of black adults in the United States. *J. Am. Med. Assoc.* 263:845–50

Packham J. 1991. *Power as a neglected variable in the assessment of the class/health relation*. Presented at Ann. Meet. Am. Soc. Assoc.

Pappas G, Queen S, Hadden W, Fisher G. 1993. The increasing disparity in mortality between socioeconomic groups in the United States, 1960 and 1986. *New Engl. J. Med.* 329:103–15

Passannante MK, Nathanson C. 1985. Female labor force participation and female mortality in Wisconsin 1974–78. *Soc. Sci. Med.* 21:655–65

Polednak AP. 1991. Black-white differences in infant mortality in 38 standard metropolitan statistical areas. *Am. J. Pub. Health* 81: 1480–82

Polednak AP. 1993. Poverty, residential segregation, and black/white mortality rates in urban areas. *J. Health Care Poor Underserv.* 4:363–73

Power C, Manor O, Fox AJ, Fogelman K. 1990. Health in childhood and social inequalities in health in young adults. *J. Royal Statist. Soc.* 153 Part 1:17–28

Powers M, Holmberg J. 1982. Occupational status scores: changes introduced by the inclusion of women. In *Measures of Socioeconomic Status: Current Issues*, ed. M Powers, pp. 55–81. Boulder, CO: Westview

Rice MF, Winn M. 1990. Black health care in America: a political perspective. *J. Natl. Med. Assoc.* 82:429–37

Robins LN, Regier DA, eds. 1991. *Psychiatric Disorders in America: The Epidemiologic Catchment Area Study*. New York: Free Press

Robinson J. 1984. Racial inequality and the probability of occupation-related injury or illness. *Milbank Q.* 62:567–90

Rogers RG. 1992. Living and dying in the U.S.A.: sociodemographic determinants of death among blacks and whites. *Demography* 29:287–303

Rogler LH, Cortes DE, Malgady RG. 1991. Acculturation and mental health status among Hispanics. *Am. Psychol.* 46:585–97

Rogot E. 1992. *A Mortality Study of 1.3 Million Persons by Demographic, Social and Economic Factors: 1979–1985 Follow-up: US National Longitudinal Mortality Study*. Bethesda: Natl. Inst. Health, Natl. Heart, Lung, and Blood Inst.

Rose G. 1985. Sick individuals and sick populations. *Int. J. Epidemiol.* 14:32–8

Rowley DL, Hogue CJR, Blackmore AC, Ferre CD, Hatfield-Timajchy K, et al. 1993. Preterm delivery among African-American women: a research strategy. *Am. J. Prev. Med.* 9(supp.):1–6

Ruggles P. 1990. *Drawing the Line: Alternative Poverty Measures and their Implications for Public Policy*. Washington DC: Urban Inst.

Schoendorf KC, Hogue CJR, Kleinman JC, Rowley D. 1992. Mortality among infants of black as compared with white college-educated parents. *New Engl. J. Med.* 326:1522–26

Schwartz E, Kofie VY, Rivo M, Tuckson RV. 1990. Black/white comparisons of deaths preventable by medical intervention: United States and the District of Columbia 1980–1986. *Int. J. Epidemiol.* 19:591–98

Sheak R. 1988. Poverty estimates: political implications and other issues. *Sociol. Spectrum* 8:277–94

Singer M. 1986 Toward a political economy of alcoholism. *Soc. Sci. Med.* 23:113–30

Smith DG, Bartley M, Blane D. 1990. The black report on socioeconomic inequalities in health 10 years on. *Br. Med. J.* 301:373–77

Smith EM. 1993. Race or racism? Addiction in the United States. *Ann. Epidemiol.* 3:165–70

Smith JP, Welch FR. 1989. Black economic progress after Myrdal. *J. Econ. Lit.* XXVII: 519–64

Sorel JE, Ragland DR, Syme SL, Davis WB. 1992. Educational status and blood pressure: the Second National Health and Nutrition Examination Survey, 1976–1980, and the Hispanic Health and Nutrition Examination Survey, 1982–1984. *Am. J. Epidemiol.* 135: 1339–48

Sorlie PD, Backlund E, Johnson NJ, Rogot E. 1993. Mortality by Hispanic status in the United States. *J. Am. Medical Assoc.* 270: 2464–68

Sterling TD, Weinkam JJ. 1989. Comparison of smoking-related risk factors among black and white males. *Am. J. Industr. Med.* 15: 319–33

Sutton R, Kahn RL. 1987. Prediction, understanding and control as antidotes to organizational stress. In *Handbook of Organizational Behavior*, ed. JW Lorsch, pp. 272–85. Englewood Cliffs, NJ: Prentice Hall

Syme SL. 1991. Control and health: a personal perspective. *Advances* 7:16–27

Syme SL. 1994. The social environment and health. *Daedalus* 123:79–86.

Takeuchi DT, Williams DR, Adair RK. 1991. Economic stress in the family and children's emotional and behavioral problems. *J. Marriage Fam.* 53:1031–41

Townsend P, Phillimore P, Beattie A. 1988. *Health and Deprivation: Inequality and the North*. London, England: Croom Helm

US Bureau of the Census, Current Population Reports, Series P-60, No. 174. 1991. *Money Income of Households, Families, and Per-*

sons in the United States. Washington DC: USGPO

US Department of Health, Education, and Welfare. 1979. *Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention*. Washington DC: USGPO

US Department of Health and Human Services. 1985. *Report of the Secretary's Task Force on Black and Minority Health*. Washington, DC: USGPO

Vagaro D, Lundberg O. 1989. Health inequalities in Britain and Sweden. *Lancet* II(8653): 35–36

Vega WA, Amaro H. 1994. Latino outlook: good health, uncertain prognosis. *Annu. Rev. Pub. Health* 15:39–67

Wagener DK, Schatzkin A. 1994. Temporal trends in the socioeconomic gradient for breast cancer mortality among U.S. women. *Am. J. Pub. Health* 84:1003–06

Waitzman NJ, Smith KR. 1994. The effects of occupational class transitions on hypertension: racial disparities among working class men. *Am. J. Pub. Health* 84:945–50

Wilhelm SM. 1987. Economic demise of blacks in America: a prelude to genocide? *J. Black Stud.* 17:201–54

Wilkinson RG, ed. 1986. *Class and Health: Research and Longitudinal Data*. London: Tavistock

Wilkinson RG. 1989. Class mortality differentials, income distribution and trends in poverty 1921–81. *J. Soc. Policy* 18:307–35

Wilkinson RG. 1990. Income distribution and mortality: a 'natural' experiment. *Soc. Health & Illness* 12:391–412

Wilkinson RG. 1992a. Income distribution and life expectancy. *Br. Med. J.* 304:165–68

Wilkinson RG. 1992b. National mortality rates. the impact of inequality? *Am. J. Pub. Health* 82:1082–84

Williams DR. 1990. Socioeconomic differentials in health: a review and redirection. *Soc. Psychol. Q.* 53:81–99

Williams DR. 1991. Social structure and the health behavior of blacks. In *Aging, Health Behaviors and Health Outcomes*, eds. KW Schaie, JS House, D Blazer, pp. 59–64. Hillsdale, NJ: Erlbaum

Williams DR. 1992. Black-white differences in blood pressure: the role of social factors. *Ethnicity & Disease* 2:126–41

Williams DR. 1994. The concept of race in *Health Services Research*, 1966–1990. *Health Serv. Res.* 29:261–74

Williams DR. 1995a. Poverty, racism and migration: the health of the African American population. In *Immigration, Race, and Ethnicity in America: Historical and Contemporary Perspectives*, ed. S Pedraza, RG Rumbaut. Belmont, CA: Wadsworth. In press

Williams DR, ed. 1995b. Special issue on racism and health. *Ethnicity & Disease*, 5: In press

Williams DR, Lavizzo-Mourey R, Warren RC. 1994. The concept of race and health status in America. *Pub. Health Rep.* 109:26–41

Williams DR, Takeuchi D, Adair R. 1992. Socioeconomic status and psychiatric disorder among blacks and whites. *Soc. Forces* 71: 179–94

Wilson TW, Grim CE. 1991. Biohistory of slavery and blood pressure differences in blacks today. *Hypertension* 17(suppl. I):122–28

Wilson WJ. 1987. *The Truly Disadvantaged.* Chicago: Univ. Chicago Press

Wise PH, Pursley DM. 1992. Infant mortality as a social mirror. *New Engl. J. Med.* 326: 1558–60

Woolhandler S, Himmelstein DU, Silber R, Bader M, Harnly M, Jones AA. 1985. Medical care and mortality: racial differences in preventable deaths. *Int. J. Health Serv.* 15:1–11

Wu, C-l, Ross, CE. 1994. *Education, Age, and Health.* Presented at Annu. Meet. Am. Sociol. Assoc., Los Angeles

Zane NWS, Takeuchi DT, Young KNS, eds. 1994. *Confronting Critical Health Issues of Asian and Pacific Islander Americans.* Thousand Oaks, CA:Sage

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WORLD-SYSTEMS ANALYSIS

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ABSTRACT

This is a review of recent research on world-systems. We cover studies of the current system and studies that compare the contemporary global system with earlier, smaller intersocietal systems. Research on the cycles and secular trends found in the modern world-system is discussed at length. This includes an examination of economic cycles of various lengths as well as their links with broader cycles like the rise and fall of hegemonic core powers, international financial crises, and the cycle of global war. We also survey recent studies of core-periphery hierarchy.

INTRODUCTION

Today the phrases "world-economy," "world-market," and even "world-system" are commonplace, appearing in the sound-bites of politicians, media commentators, and unemployed workers alike. But few know that the most important source for these phrases lies with work started by sociologists in the early 1970s. At a time when the mainstream assumption of accepted social, political, and economic science was that the "wealth of nations" reflected mainly on the cultural developments within those nations, a rapidly growing group of social scientists[1] recognized that national "development" could only

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[1] The world-systems perspective originated primarily in sociology, but it has spread to many other social science disciplines. This is in part the case because the study of whole world-systems is necessarily a transdisciplinary undertaking. Our review therefore includes the work of political scientists, geographers, anthropologists, historians, and archaeologists as well as sociologists.

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be understood contextually, as the complex outcome of local interactions with an aggressively expanding European-centered "world" economy. Not only did these scientists perceive the global nature of economic networks 20 years before such networks entered popular discourse, but they also saw that many of these networks extend back at least 500 years. Over this time, the peoples of the globe became linked into one integrated unit: the modern "world-system."

Now, 20 years on, social scientists working in the area are trying to better understand the history and evolution of the whole system, as well as how local and national regions have been integrated into it. This current research has required broadening our perspective to include ever larger periods of historical time and geographical space. For example, some recent research has compared the modern Europe-centered world-system of the last 500 years with earlier, smaller intersocietal networks that have existed for millennia. Other work attempts to use the knowledge of cycles and trends that has grown out of world-systems research to anticipate events likely in the future with a precision impossible before the advent of the theory. This is still a new field, and much remains to be done.

Our review of current research focuses on three main topics:

* How different definitions of the world-system concept imply different ways of breaking down history into discrete periods (e.g. when did the current system begin, and what are the relevant criteria for separating it from other systems in either time or space?).
* How the patterned changes introduced by trends and cycles structure the reproduction of the modern world-system
* How the global hierarchy of wealth and power reproduces itself by the constraints it imposes on the range of policy options for most nations.

What Are World-Systems, and Why Do They Matter?

The way we define a "world-system" reflects both our understanding of history and the questions we try to answer. For example, how connected must peoples be before we call them a "system?" How does a "world-system" differ from a "society"? Have there been several such systems in history, and, if so, what distinguishes one from another in time or space? While these questions may at first seem abstract and scholastic, our answers define and channel our understanding of history and thereby directly affect our understanding of the present. How we respond to the challenges of our times reflects our analysis of history. Some of the most important of these issues are surveyed here.

The modern world-system is understood as a set of nested and overlapping interaction networks that link all units of social analysis—individuals, households, neighborhoods, firms, towns and cities, classes and regions, national states and societies, transnational actors, international regions, and global structures. The world-system is all of the economic, political, social, and cultural relations among the people of the earth. Thus, the world-system is not just "international relations" or the "world market." It is the whole interactive system, where the whole is greater than the sum of the parts. All boundaries are socially structured and socially reproduced, as are the identities of individuals, ethnic groups, and nations (Chase-Dunn & Hall 1993). Within this system of nested networks, bulk goods exchanges are spatially restricted by transport costs to a small region, political/military interactions occur over a larger territory, and prestige goods exchanges are the largest important interaction networks. For any particular group it is the whole nested network with which it is interconnected that constitutes its "world-system." Systemic interaction is routinized so that the connected actors come to depend, and to form expectations, based on the connections.

One of the most important structures of the current world-system is a power hierarchy between core and periphery in which powerful and wealthy "core" societies dominate and exploit weak and poor "peripheral" societies. Within the current system, the so-called "advanced" or "developed" countries constitute the core, while the "less developed" countries are in the periphery. The peripheral countries, rather than developing along the same paths taken by core countries in earlier periods (the assumption of "modernization" theories), are instead structurally constrained to experience developmental processes that reproduce their subordinate status. Put simply, it is the whole system that develops, not simply the national societies that are its parts.

In this moving context, core and peripheral countries generally retain their positions relative to one another over time, although there are individual cases of upward and downward mobility in the core/periphery hierarchy. Between the core and the periphery is an intermediate layer of countries referred to as the "semiperiphery." These combine features of both the core and the periphery, and they are located in intermediate or mediating positions in larger interaction networks.

The Emergence of the World-System Concept

The originator of the current world-systems perspective is Immanuel Wallerstein, who argues in his book the *Modern World-System I: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century* (1974), that a world-system is *a multicultural territorial division of labor in which the production and exchange of basic goods and raw materials is necessary for the everyday life of its inhabitants.* It is thus by definition composed of culturally different societies that are vitally linked together through the exchange of food and raw materials.

Wallerstein also understands the modern Europe-centered world-system to be the first capitalist system. Earlier systems were based to a much greater extent on the use of the coercive power of states. It is this same capitalist quality that also, he argues, accounts for another of the unique features of the modern world-system—its political structuring as an "interstate system" of unequally powerful and competing states. Wallerstein contends that earlier world-systems tended periodically to turn into "world-empires" in which the economic division of labor between core and peripheral regions became largely encompassed by a single political entity—an empire. Examples are ancient Rome and China.

The modern world-system, Wallerstein argues, has not experienced this kind of empire-formation because no single state has managed to conquer the entire core region. Rather, the core has remained composed of several states, while exhibiting a phenomenon called the "hegemonic sequence"—the rise and fall of hegemonic core states (e. g. the seventeenth century Netherlands, nineteenth century Britain, and the United States in the twentieth century). The hegemonic structures of the modern world-system are thus less politically centralized than were the earlier core-wide empires. Wallerstein attributes this again to the unique extent to which the modern system is based on capitalist accumulation.

Wallerstein's key insight lies with the realization that trading patterns prevailing at different points in history demonstrate the essential economic interdependence of the societies involved, whether or not they were united by a single political center.[2] In addition Wallerstein contends that the mode of production (e. g. capitalism, tributary[3] modes) should be used to distinguish between different systems in both time and space. Thus, according to Wallerstein, the Ottoman Empire and Mughal India were not part of the European modern world-system before they were forcibly incorporated into the periphery of the modern world-system as producers of low-wage commodities for export to the core. They were separate systems, according to Wallerstein, because Europe was capitalist while the Ottoman Empire and India were still predominantly tributary.

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[2] His emphasis on the importance of the economic division of labor in the exchange of basic foods and raw materials is meant to exclude the consideration of the exchange of luxury goods, which Wallerstein calls "preciosities." He argues that the exchange of luxury goods is not important for systemic dynamics and therefore that spatial links based on the exchange of luxury goods should not be used to spatially bound world-systems.

[3] The "tributary mode of production" is meant to apply to and describe those precapitalist societies whose core region extracted "tribute" from its subjugated periphery. This tribute served as a type of "protection racket" whereby the periphery bought peace from invasion by the core. The visability of this payment can be contrasted with the "hidden" transfer of value from periphery to core that occurs with capitalism today via the mechanism of unequal exchange (Amin 1976).

Alternative definitions of the world-system concept have emerged in more recent work with the effort to study change over longer periods of time, and to compare the modern system with earlier, smaller systems. Andre Gunder Frank and Barry Gills (1993:106) define world-systems as follows:

> The transfer or exchange of economic surplus is the fundamental criterion of a world systemic relationship. Diplomacy, alliances, and conflict are additional, and perhaps derivative, criteria of systemic interaction.

Following the lead of Jane Schneider (1977) and other anthropologists, Frank & Gills contend (contra Wallerstein) that the exchange of luxury goods is also important for the reproduction of local social structures. Thus, networks of the exchange of prestige goods should be used to bound world-systems, and the Europe-centered system studied by Wallerstein then becomes redefined as a regional part of a much larger Afroeurasian world-system. Frank & Gills use this widened concept to study the continuities that they see in the system that emerged out of Mesopotamia with the birth of cities and states 5000 years ago.

Chase-Dunn & Hall (1993:855) widen the world-system concept even further. They define world-systems as *intersocietal networks in which the interactions (e.g. trade, warfare, intermarriage) are important for the reproduction of the internal structures of the composite units and importantly affect changes that occur in these local structures.* This approach was designed to facilitate comparisons between the modern global system with earlier, smaller intersocietal systems. Chase-Dunn & Hall separate the definition of the world-system concept from the existence of states and core/periphery relations. This revised conceptual apparatus makes it possible to examine structural differences as well as similarities between different types of world-systems. Very small systems of egalitarian hunter-gatherers (lacking both states and a core/periphery hierarchy) can be analytically compared with the modern global system, and the long-term processes of historical evolution can be studied using world-systems as the unit of analysis.

Regarding the spatial bounding of world-systems, Chase-Dunn & Hall (1993:860) contend that different kinds of interaction may be more or less important in different systems, and that different sorts of interaction may have different spatial characteristics. They propose a model of nested networks in which bulk goods exchanges are spatially restricted by transport costs to a small region, political/military interactions occur over a larger territory, and prestige goods exchanges are the largest important interaction networks. For any particular group it is the whole nested network with which it is interconnected that constitutes its "world-system." Systemic interaction is understood as regularized in such a way that the connected actors come to depend and form expectations based on the connections.

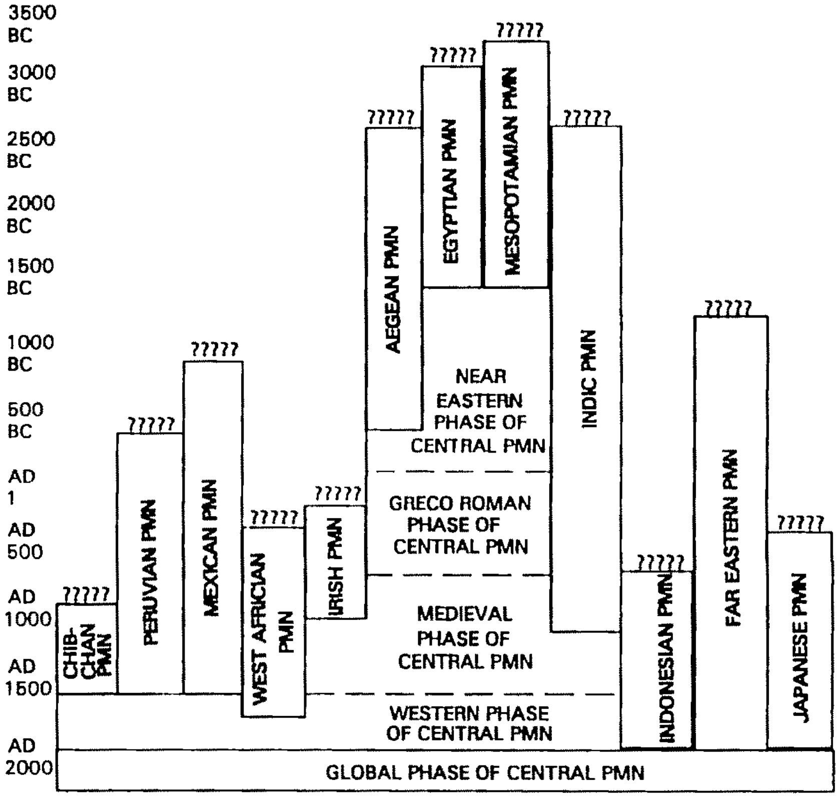

Figure 1 The incorporation of 12 PMNs into one central political/military interaction network. This figure illustrates the successive incorporation of autonomous PMNs into a larger, composite "Central PMN" (after Wilkinson 1987:32).

Recent Research on Delineating World-System Boundaries

The use of data for spatially bounding world-system interactions is still in its infancy. The best work to date has been done by David Wilkinson (1987, 1991) who studies the boundaries of political/military interaction networks (PMNs). Wilkinson conceptualizes "world-systems/civilizations" primarily in terms of military alliances and conflicts among a group of states in a region. Using this type of interconnection, Wilkinson produces a spatio-temporal map of the expansion of "Central Civilization," the world-system that was formed by the merging of the Mesopotamian and Egyptian world-systems in the fifteenth century BCE (Before Common Era).[4] Wilkinson shows how twelve regional world-systems became engulfed by the expanding Central System (see Figure 1). He also discusses the boundaries of the larger "trade oikumene" and its expansion (Wilkinson 1992, 1993). This is equivalent to the "prestige goods network," the largest network in Chase-Dunn & Hall's nested conceptualization of system boundaries.

World-Systems and Modes of Accumulation

Another basic conceptual issue yet to be resolved concerns the temporal bounding of world-systems and the question of similarities or qualitative differences in systemic logic. The debate on this issue revolves around the logic of accumulation.[5] Recall that Immanuel Wallerstein asserted that the modern world-system is unique because it is capitalist. He thought that the transition from feudalism to capitalism happened for the first and only time in sixteenth century Europe. Subsequent transitions in the mode of accumulation in the rest of the world have resulted from the global expansion of and conquest by the formerly regional Europe-centered world-system. Wallerstein contends that it is only in the post-sixteenth century capitalist world-economy that powerful actors focus primarily on the goal of "ceaseless accumulation." While he acknowledges that there has been a trend toward ever greater commodification and the expansion of capitalism within the modern world-system since the sixteenth century, for Wallerstein it was then that the European world-system first became a capitalist system uniquely different from the precapitalist world-systems elsewhere on earth.[6] Samir Amin (1993) has also agreed that a transformation in systemic logic happened in the way Wallerstein described, while at the same time acknowledging that precapitalist world-systems also had important core/periphery dimensions and processes of uneven development in which old core areas were superseded by new ones.

But Frank & Gills (1993), and earlier, Ekholm & Friedman (1982), contend that capitalism has been an important aspect of the Eurasian world system for millennia. Documentary evidence confirms the existence of commodified forms of wealth and property and exchange in the early states and empires of the Near

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[4] We use the conventions now employed by world historians to designate temporal eras in a less Eurocentric manner. Thus CE means "common era" (after the birth of Christ), and BCE means "before common era.

[5] We use the term "mode of accumulation" as approximately equivalent to the structuralist Marxist "mode of production," but without the implication that only production processes are important for systemic logic.

[6] Wallerstein also contends that capitalism is a feature of the whole world-system, not of its parts. Thus capitalism—the accumulation of economic surplus by means of the production and sale of commodities—exists in both the core and the periphery. In the periphery, capitalism is importantly combined with institutions of coercion, while in the core, market forces and the commodification of labor play a greater part in social control and reproduction.

East. This evidence contradicts the claims of Karl Polanyi (1957) and his colleagues that market trade was completely absent from these early state systems and that all exchange was state administered. Ekholm & Friedman (1982) assert the existence of a "capital-imperialist" mode of accumulation in which core states and wealthy families exploited peasants and peripheral regions by means of a combination of capitalist accumulation and state-organized extraction and conquest. They argue that the core regions of both ancient and modern world-systems oscillate between state-based and capitalist accumulation.

Frank & Gills adopt a similar position that argues for the continuity in systemic logic in a single 5000-year-old world-system that emerged out of the Near East and eventually expanded to the whole globe. Frank & Gills (*The World System: Five Hundred Years Or Five Thousand?* 1993), contend that there was no transition from feudalism to capitalism in Europe in the sixteenth century, because the world-system has had the same capital-imperialist mode of accumulation for five millennia. Frank & Gills also contend that China was the core of the Afroeurasian world system until at least the eighteenth century CE. Europe remained a peripheral backwater, exporting bullion to China in exchange for silk and porcelain.

Chase-Dunn & Hall (1993) have expanded the scope of world-system research in yet another direction to include small stateless and classless intersocietal systems. This allows them to study earlier examples of qualitative transformations in systemic logic from kin-based to state-based modes of accumulation. They also note the existence and growing importance of commodified wealth, land, exchange, and labor in the precapitalist world-systems, but they agree with Wallerstein and Amin that the Europe-centered subregion of the Afroeurasion world-system was the first region to experience a predominantly capitalist regional system. Many commodified institutional forms developed inside the tributary empires, especially Rome and Han China. The Sung Empire in particular nearly underwent a transformation to capitalism in the tenth century CE. But the only states to be controlled by capitalists before the European transformation in the seventeenth century were semiperipheral capitalist city states such as the Phoenician cities, Venice, Genoa, Malacca. These operated in the interstices between the tributary states and empires, and though they were agents of commodification, they existed within larger systems in which the logic of state-based coercion remained dominant.

Chase-Dunn & Hall (1993) contend that capitalism became predominant in Europe because territorial states were weak and capitalist cities were closely packed. This facilitated the development of market exchange as the European economy grew out of stagnation and isolation. The first capitalist "nation-state" was the Dutch Republic of the seventeenth century, and this coming to state power by capitalists in an emerging core region signaled the triumph of regional capitalism in the European subsystem.

Cross–World-Systems Research

Because these theoretical debates are quite recent, there has been little systematic research intended to support or contest the different hypotheses. Frank (1993b) has specified a periodization of approximately 500 years for economic/political cycles in the Eurasian world-system throughout the Bronze and Iron ages. He asserts that since 1700 BCE the whole Eurasian world system has experienced system-wide 250-year upswings followed by 250-year downswings. The evidence for or against Frank's cycles is mixed. Counting the number of cities reported in Chandler's (1987) compilation of the world's largest cities, Wilkinson (1991) found support for Frank's hypothesized cycles. Bosworth (1993), analyzing city growth and size distributions, also found mixed support for Frank's very long cycles. But Chase-Dunn & Willard (1993), using data on the population sizes of cities based on Chandler, found that city growth and stagnation corresponded with only about half of Frank's phases. Chase-Dunn & Hall (1994) found little correspondence between changes in the territorial size of empires and Frank's phases.

In an effort to assess the hypothesis of an integrated Eurasian-wide world-system prior to the rise of European hegemony, Chase-Dunn & Willard (1993) discovered an apparent simultaneity of patterns of urban growth and changes in the city-size distributions of Near Eastern and Chinese political/military networks (PMNs) from 450 BCE to 1600 CE. These simultaneous sequences of expansion and contraction lend support to the notion that China and the Mediterranean/Near East were strongly linked much earlier than most world historians have supposed. This simultaneity is further supported by Chase-Dunn & Hall's (1994) analysis of changes in the territorial size of empires.[7] Yet at the same time, these sequences of urban growth, changes in city-size distributions, and in the territorial sizes of empires were found to be quite different for the South Asian (Indic) PMN (Chase-Dunn & Hall 1994).

Data on the sizes of the largest cities (Chase-Dunn & Willard 1994) support Frank's contention that Europe remained inferior and peripheral to the large empires of the Near East and China until the late eighteenth century. London was still smaller than Peking in 1825.[8]

[7] Just what caused the Far Eastern/Mediterranean simultaneity is unknown. Frank's (1992) analysis of the "centrality of Central Asia" in the developmental processes of the Eurasian world-system is quite plausible.

[8] In the absence of other data, urban population can be used as a surrogate variable for the range of power exercised by that city over its surrounding area. The reason is that city dwellers are parasites on the work of the farmers, and the greater the number of these parasites, the larger the area from which they draw their agricultural surplus. By implication, the "catchment area" surrendering its surplus is under the political and military control of the city. Hence we can infer that Peking in 1825 represented a more powerful capital within its area than did London.

Core/Periphery Structures and Mobility

One of the main structures of all state-based world-systems is an intersocietal hierarchy composed of core, peripheral, and semiperipheral societies. In the modern world-system this structure has been reproduced over centuries despite the upward and downward mobility of a few national societies.

Before the modern capitalist world-system, in the era of world-empires built around the tributary mode of accumulation, peripheral societies gave up a portion of their surplus to the core in return for nominal independence, or they were absorbed altogether (in which event they gave up an even larger portion of their surplus to the imperial core). The maintenance of peripheral status during those times relied exclusively on the credible threat of military force. Today, the reproduction of the international power hierarchy is achieved more subtly through market mechanisms, and force is used only when the market "rules" (which act to sustain the dominance of the core) are challenged by insurrection. The hypothesis of "unequal exchange" (Emmanuel 1972, Raffer 1987) contends that the central mechanism by which the global market acts to gather together the global surplus and channel it to the core is through price inequality, in which the political and military suppression of wages in the periphery allows the products of peripheral labor to be much cheaper than those of the core. Put simply, an hour of labor in the periphery costs capital only a fraction of its costs in the core, so that a commodity produced there is much cheaper than the same commodity produced in the core. When core and periphery come together to exchange products in the world market, the exchange results in a net transfer of value from the periphery to the core. Hence the market masks a process of exploitation, a process backed up by the military power of the states in the periphery and, behind them, the military power of the core.

The chronic impoverishment of the periphery prevents the typical peripheral state from being able to finance programs of public welfare or infrastructural improvement (even if they wished to), so its popular legitimacy is low. It is thus always vulnerable to coups or popular insurrection. Yet despite these barriers, some states have managed gradually to improve their infrastructure and to combine these improvements with policies that encourage the key industries that seem the most promising in the world market. Occasionally, such policies pay off in upward mobility. Contemporary examples include Taiwan, Singapore, Korea, Hong Kong, and China, while Japan has achieved an upward trajectory since 1880.

Perhaps the most spectacular case of upward mobility has been the United States, a region that went from being peripheralized to a semiperiphery and then to core status (1880), and finally achieved hegemony within the core

(1945). The current decline of US hegemony is one of the salient features of sequential change in the contemporary system.

World-system theorists continue to debate the conceptualization of core/periphery relations. All agree that the core has more economic and political/military power than the periphery. The basis of this power in the current system is the concentration of innovations in new lead industries and in military and organizational technologies that affect the relative power and capacities of firms and states. Disagreements center on the degree of mobility within the system available to individual states, as well as on the mechanisms and measurable manifestations of that mobility.

Just recently some excellent work has attempted empirically to measure the placement of states in the core/periphery hierarchy. Using national states as the unit of analysis, Terlouw (1992:164) includes six variables in his index of core/periphery position: 1) GDP per capita as a percentage of world GDP per capita, 2) the percentage of world trade 1978–1983, 3) the stability of trade relations from 1961 to 1983, 4) the number of foreign embassies sent and received in 1985, 5) the number of foreign diplomats sent and received in 1985, and 6) military manpower and expenditures in 1985. Terlouw's operationalization includes two kinds of economic measures (production and trade), political measures (diplomats and diplomatic missions), and military power.

An earlier study by Arrighi & Drangel (1986) looked at changes over several decades in the distributions of GNP per capita of large numbers of national societies. This kind of time depth is quite important for analyzing structural change in the world-system. Arrighi & Drangel found a rather stable tri-modal (core-semiperiphery-periphery) distribution of national GNPs. But the use of GNP per capita by itself led to strange conclusions, such as the inclusion of Libya in the core because of its high revenues due to oil resources. Nevertheless the Arrighi & Drangel work remains one of the most valuable contributions to the study of the whole core/periphery hierarchy. A more recent study, by R Korzeniewicz & Martin (1994), of distributions of GNP uses data on more countries and more time points to confirm the findings of Arrighi & Drangel. Terlouw's multicomponent measure corrects the errors due to reliance on any single measure. Terlouw's measure assumes an approximately equal weight between economic and political/military dimensions of power.[9]

Much excellent recent work has been done on core/periphery relations using the concept of "commodity chains," the global sequences by which raw materials, production processes, and final consumers are linked (e.g. Gereffi & M. Korzeniewicz 1994).

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[9] Terlouw (1992:220) usefully compares his measure with those used in five other studies of core/periphery position.

Another important research tool is the application of social network analysis to the core/periphery problem. It is argued that network measures are superior to attribute measures because the core/periphery position of countries is relational, that is relative to other countries. The network approach uses measures of intercountry interaction to locate countries within interactional networks in terms of their positional similarities and differences with other countries in the networks. Usually these measures combine several different kinds of interaction networks that are claimed to be important dimensions of world-system position. The contention that network measures are superior to attribute measures has been argued but not demonstrated. The question of method of operationalization is always confounded with the question of the substantive content of the measures. The only network study that examines change over time (Smith & White 1989) confirmed many world-systems hypotheses about recent changes in the world division of labor between 1965 and 1980. Smith & White also improved upon earlier network analyses by using a method that examines more abstract role equivalence rather than strict structural equivalence. Structural equivalence tends to group countries that are connected to exactly the same other countries, thus overemphasizing geographical propinquity at the expense of similarities of role in the world division of labor (see Schott 1986). More work of this kind needs to be done.

Strang (1990) used event history analysis to study patterns of decolonization in the world-system between 1870 and 1987. He derived competing hypotheses from the world-systems and world polity perspectives, and his results lend support to both approaches. The "world polity" approach refers to the positions advanced by those scholars who contend that a consensual and institutionalized global culture has important effects on development in the world-system, e.g. Thomas et al (1987). Other important empirical studies have analyzed the process of world culture formation (e. g. Cha 1991, McNeely 1993).

In a cross-national study of the effects of foreign investment on the economic growth of peripheral and semiperipheral countries, Firebaugh (1992) presents data that he believes cast doubt on earlier findings. Several earlier studies reported evidence that dependence on foreign investment (i.e. having a national economy with a relatively high ratio of foreign to domestically controlled capital stock) had a negative effect on the growth of GNP per capita over periods of 10 to 20 years (e. g. Bornschier & Chase-Dunn 1985). Firebaugh closely replicated the analysis of Bornschier & Chase-Dunn, and he found a similar negative coefficient for the measure of investment dependence (PEN), but he interpreted this as due to the fact that foreign capital investment has a less positive (rather than a negative) growth effect than domestic capital does. Firebaugh contends that the negative coefficient is due to a methodological artifact—a version of the ratio problem. The dependence measure, PEN, is the ratio of the stock of foreign investment to the size of the national economy. Firebaugh points out that the stock measure is the denominator of the investment rate, the ratio of new investment to the stock of investment, which Firebaugh contends is the real engine of economic growth. Firebaugh argues that, because PEN is the denominator of the (foreign) investment rate, when PEN is high the investment rate is low, and vice versa. Thus, the negative coefficient of PEN is alleged to be due to this fact.

But Firebaugh presents a new finding that must be disturbing to all those who want to understand the causes of national development. He shows (1992: Table 4, p. 121) a significant negative coefficient for the domestic stock effect on economic growth. This, he argues, supports his interpretation that the negative coefficient of the PEN measure is really an artifact due to the ratio problem. Does dependence on domestic capital stock also have a negative effect on growth? That would seem unlikely. Is Firebaugh right? Dixon & Boswell (1995) have shown that the significant negative effect of PEN remains after controlling for the foreign investment rate. This undermines Firebaugh's interpretation. New research using better and more recent data would add greatly to our understanding of these processes.

Trends and Cycles in the Modern System

Despite disagreements over the continuity of systemic logics, all scholars agree that world-systems exhibit both developmental cycles and long-term trends. Some of these trends and cycles are thought to operate over very long time spans and in very different kinds of regional world-systems, while others are limited to specific kinds of world-systems. Further research will reveal more information about cycles and trends in earlier history.

Trends: Population

While population growth has always been an important cause and consequence of the historical evolution of world-systems, the pace of population growth has increased dramatically in the modern world. Research has indicated that fertility is mainly affected by economic factors (Folbre 1977, Gimenez 1977, Grimes 1981, Mamdani 1972, Seccombe 1983). An important implication of this finding is that the structure of economic incentives and costs accompanying each type of world-system structure varies across both classes and accumulation modes. For example, universal and state-subsidized education among the contemporary states of the core, combined with wage scales that (until recently) made possible the support of children by their parents, has removed the economic incentive to have large families. But in the periphery, the persistence of a semi-proletarianized, semi-peasant coerced work-force suspended between the current capitalist and "tributary" modes sustains the high value of children as valuable economic assets and continues to provide a motivation for high rates of fertility.

A similar analysis of the changing structure of incentives over time with the European transition to contemporary capitalism has suggested the succession of three distinct fertility regimes, each assigning to children and parents different functions as the peasantry gradually succumbed to proletarianization (Seccombe 1983). In the absence of economic change, female literacy is known to be an important factor in lowering fertility. Yet the economic reward structure guiding fertility in the periphery cannot be entirely eliminated by increases in literacy, so planetary population growth rates can be expected to meet whatever growth ceilings exist.[10] Declining indigenous population growth rates in the countries of the core[11] have often been held out as exemplars of the generic human future. But this suffers from the same error as older "modernization" theories, which held that the structures of the core were the future of the periphery. Instead, for the majority of the human population that has always been located in the periphery, the ascendance of the capitalist mode has actually acted to *encourage* population growth.

Technological Change

Technological change has also accelerated in modern capitalism. In earlier systems, the implementation and diffusion of new approaches and techniques were slow because such novelties were evaluated against, not just their effect on production efficiency, but also their potential effect on the structures of social stratification (Anderson 1974a). For a new technique to displace an old one, it had to be compatible with the preexisting "occupational structure" so that traditional status hierarchies were not challenged. Under the current capitalist mode, consideration of the social effects of technical change is largely ignored, because the producers are firms whose guiding principle is their individual profit and the suppression of their production costs, not the effect of technological change on the broader social structure. Further, inter-firm competition compels firms to be on a constant and aggressive search for new techniques that hold the promise of reducing production costs. Hence the rate of technical change has blossomed within contemporary capitalism in a way that has been historically unprecedented. Meanwhile, the energy required to drive that technology has risen far faster than even the geometric growth of the population (Singer 1970, Star 1971).

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[10] The precise location of these ceilings is difficult to discern, and considerable debate has occurred over where they may lie. Worldwatch (1994) has announced that they believe those limits to have already arrived, while others think that they may not be reached until the planetary population hits 20 billion. Given the geometric nature of the growth, even the most generous estimates will be surpassed in only a few decades.

[11] As distinct from the growth rates characteristic of new immigrants from the periphery, who tend to continue their historic patterns of high fertility.

Commodification

Another trend that modern capitalism has accelerated is that of "commodification" (Wallerstein 1984b). By this is meant the assignment of a market "price" to an ever-expanding percentage of the products of human activity. In the early stages of capitalism, money complemented barter as a method of payment, while only those products created specifically for trade were created simply with an end-market in mind (e. g. textiles). In this early phase, the population was largely agricultural and food and clothing were individually produced as needed by each family or community (Braudel 1984: Vol. 1). As late as the second half of the nineteenth century, workers in the United States were still expected to supplement their wages with private gardens (Braverman 1974). In the age of McDonald's this seems surprising—itself an indicator of just how far the trend toward commodification has progressed.

Proletarianization and Capital Intensivity

Among the most important subjects of the trend toward commodification has been human labor itself. The wage relation between employers and employees is widespread in both the core and the periphery. Because this means that human labor is a precisely priced cost of production, the cost of labor can more easily be compared with machinery, and where the latter "wins," labor is expelled. In this way labor costs are a constant inducement toward cheaper and more capable machinery, along with cheaper energy to run them. This has meshed with, and largely powered, the drive toward faster technological change. The overall pattern has been the displacement of labor by machinery, which can as well be described as the substitution of "inorganic" for "organic" energy. While an increase in economic efficiency (more items produced per wage dollar spent) is the motivation for this substitution, it entails environmental costs that are undervalued by the calculus of capitalism (e. g. global warming, ozone depletion, topsoil loss, and deforestation—all linked in various ways to mechanization and automation).

Increasing Size of Firms

Despite oscillations, in the last 200 years the largest firms have grown by every measure: production capacity, number of employees, amount of capital controlled, and size of the market. This "monopoly" sector, characterized by a small number of huge firms, was originally born out of the broader "competitive" sector of small-scale companies, and the competitive sector continues to be reproduced (O'Conner 1973). But the emergence of the monopoly sector has changed the face of modern capitalism most obviously in the realm of international trade, notwithstanding the recent literature on "post-modern" flexible accumulation (Harvey 1989). Among the key advantages accruing to large size are cheap access to large amounts of capital. This access allows for ready reinvestment in up-grading older production facilities or building new ones, enabling the development and implementation of new technologies. This applies not just to production, but also to marketing and the substitution of new materials. Access to capital also allows for financing new bouts of automation with new waves of investment, thereby propelling the secular trend toward greater capital intensivity.

Geographically, the physical area that a company's decisions could affect—because of the range of local markets they supply, or the area from which they draw their employees, or the number of governments to which they pay taxes—has continually expanded, albeit unevenly and cyclically.

State Formation

It has been argued that the European nation-state arose to facilitate the prosecution of war (Tilly 1989). This may be true, but another important function of the modern state has been to control the economy and the surplus it generates, because it depends on this surplus for its basic existence.

The power of states over the lives of their citizens has been expanding since the beginning of the first states, but this expansion has grown explosively in the last two centuries (Foucault 1980, Boli-Bennett 1980). While the "Absolutist State" emerging during the end of feudalism asserted arrogant claims about the power of the monarch over the lives, bodies, and property of subject citizens (Anderson 1974b), only today has technology enabled some of these claims to become almost literally true. This expansion of the state has taken on two forms: a geographical expansion of the power of the central government ever farther away from the capital city, combined with a deepening of its power over the daily life of its citizens.

Each bout of corporate and state expansion seems to have followed the same general course: A wave of technological change enabled an expansion in corporate size and control, stimulating popular demands for compensatory regulation on a corresponding governmental scale. Corporate attempts to evade regulation have often involved crossing governmental boundaries, in turn leading to bilateral and multilateral agreements between governments on regulations. Each round has led to an expanded state chasing after an expanding corporate size. International political integration has increased the level of global governance such that some world-system scholars predict the eventual emergence of a world state (e.g. Chase-Dunn 1990, Arrighi 1990).

Trend Limits

As with population growth, there are ceilings to each of these trends. Technical change often relies on energy sources that are not infinite while producing effluents that are deadly; commodification requires the equal expansion of the ability to pay; proletarianization is curtailed by automation; both corporate and governmental size must stop at the global level.

Each ceiling has the capacity to throw the modern capitalist world-economy into either acute crisis or systemic collapse. For example, much of our technology relies upon the use of fossil fuels, and this is the leading source of global warming. If we continue using these fuels as we have been, global warming and air pollution will kill increasing numbers of people, threatening the viability of the entire world-system on both biological and political levels. Also, as we run out of these fuels (an inevitable event), prices will rise dramatically, introducing rates of inflation that will threaten system stability.

An example of the effect of trend limits in commodification and proletarianization is provided by every recession, which is largely due to the failure by the working classes to consume an adequate volume of the products created by their own work. This is always attributable to inadequate wages (the inverse side of excessive commodification) and/or automation (the necessary by-product of proletarianization). The recent depression in the world-economy between 1985–1994 illustrates these limits. Automation (fossil fuel–dependent) is generating a vast and growing number of unemployed who lack the ability to buy. In the United States the employed remainder brings home a real wage equal to, or less than, the amount in 1973. This has placed a restraint on the economic recovery and may eventually block growth altogether, pending a redistribution of income. Such a situation is already creating a crisis of political legitimacy and economic viability evident throughout the core in rising rates of unemployment and political extremism.

These examples should highlight just how vulnerable the current world-system is, and how close to its limits we have already come. Current rates of increase in population and energy use combined with capitalism as it exists today simply cannot be sustained, so a major breakdown is as inevitable as earthquakes in California, yet equally difficult to pin down to a particular moment. This should become clearer after the review of research on cycles below. Different cycle phases either accelerate or retard trend developments, and each cycle acts along its own time-scale. The sum of the respective influences of all of these cycles and trends affects the likely trajectory of our collective future.

Cycles

Cycles in production have always existed. In societies closely tied to agricultural production, the cycle of the seasons imposes an annual periodicity on planting and harvests. Longer-term fluctuations in economic output in the precapitalist era have also been noted (Chase-Dunn & Willard 1993, Frank & Gills 1993).

In the current period, economic cycles appear to be endemic to modern capitalism, and several have been identified, which differ mainly in length. The most important among these are the Juglar cycle of 6–10 years, the Kuznets cycle of 20–25 years, and the Kondratieff (also known as the "long wave"), thought to last around 50 years (Kleinknecht et al 1992, Modelski & Thompson, forthcoming, Mandel 1975:133–61).

Regardless of length, each has a similar underlying logic: A new set of products is introduced that sells well, the market expands, and related employment swells, allowing for an expansion of worker/"consumer" spending. The market eventually becomes saturated, sales drop, income contracts, and workers are laid off. The effect of the contraction is prolonged by the extended feed-back loop through those firms producing capital goods. These manufacturers of the means of production take orders in advance, which means that they are producing machinery for constructing the end-product long after the slump in sales of that product has started. This long feed-back only prolongs the downturn. But eventually, the excess inventory is sold out, production resumes, and renewed growth is possible (Mandel 1968, 1975, Marx 1967).

Juglar Cycles

Otherwise known as the "normal" or "classic" business cycle, such a cycle lasts 7–10 years (Gordon 1986:522, Maddison 1982:77). Even though discussions of these cycles can be traced as far back as Marx (1967), the National Bureau of Economic Research has conferred upon them the name of the much more recent Jacek Juglar. !12 Thecauseoftheseparticularcyclesisthoughttolie in the average life span of capital equipment: After around eight years, the machinery of production tends to wear out or depreciate to the point that replacement becomes necessary (Moore & Zarnowitz, in RJ Gordon 1986: 738). The fact that the periodization of equipment purchases and factory construction within firms also becomes synchronous across firms throughout the economy as a whole reflects how the firms are themselves customers of one another. Recent examples of Juglar downturns in the United States are the recessions of 1990–1992, 1981–1983, and 1975–1976.

Kuznets Cycles

In works published at various times through the period 1930–1960, Simon Kuznets traced what appeared to be cycles of around 20–25 years in the records of a variety of indicators for several core states and one semi-peripheral state (United States, United Kingdom, France, Germany, Belgium, Canada, Japan, Australia, and Argentina) (Maddison 1982:262, note 15). These cycles have

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[12] This despite Maddison's assertion that "Juglar never claimed to have discovered the existence of an eight- to nine-year rhythm" (Maddison 1982:77).

been the subject of many different investigators (e. g. Grimes 1993, Thomas 1954, Solomou 1990), and several hypotheses have been put forward for their cause, although none has been uniformly accepted (Maddison 1982:73–77). Because the phases of the cycle are opposite for the United States and Britain for a series of years, some (e. g. Thomas 1954) have suggested that trans-Atlantic migrations might be responsible, but this explanation does not account for the synchronization of countries in the Pacific, nor the other countries measured by Maddison (1982), Solomou (1990), and Grimes (1993). One possible explanation may be to link the timing of the Kuznets oscillation to generational turnover in the demand for housing and other buildings, but this linkage is still speculative (Dassbach (1993).[13] Grimes (1993) has extended the coverage of nations to include all countries having GDP data back to 1790, and he has found that a Kuznets-length cycle exists for all countries until 1955 (see below). Although the precise mechanisms of this cycle are unknown, it is reasonable to assume that their timing is a reflection of a cyclical pattern of reinvestment, even if the precise nature of that investment is still unclear.

Kondratieff Cycles

A Soviet economist writing in the 1920s, Kondratieff observed that the historical record of prices then available to him appeared to indicate a cyclic regularity of phases of gradual price increases followed by phases of decline (Kondratiev, reprinted in 1979). The period of these apparent oscillations seemed to him to be around 50 years.

Kondratieff's controversial concept of a 40–60-year-long cycle has faded in and out of academic favor often since he wrote. Most recently, the onset of persistent sluggishness in the world economy in the 1970s has brought about a revival (Berry 1991, Freeman 1984, Goldstein 1988, Gordon 1978, Kleinknecht et al 1992, Mandel 1975 1980, DiMatteo et al 1986, Van Duijn 1983). Despite enormous ideological differences, all of these scholars are united in arguing that long waves are marked and powered by massive investments in new infrastructure (Goldstein 1988).

The basic argument is that periodically (approximately every 40–60 years), factories, means of production, communication, and transport are all rebuilt incorporating new technologies. A list of specific historical examples of such "revolutionary" new technologies could include the construction of paved roads (Braudel 1984(Vol. 3):316–17), the centralized factory system of manufacture (Marglin 1974), the early machinery employed in the textile mills, the infrastructure for the railroad system, the discovery and application of electric power, automobiles and the application of internal combustion engines (Baran & Sweezy 1966), electric home appliances and factory machinery, and microprocessors and robotics (Mandel 1975:Ch. 4).) Throughout the period of initial implementation of these new technologies, the "normal" business cycles (both Juglar & Kuznets) proceed unimpeded. However, recessions are shorter and recoveries surer and longer (Mandel 1975:Ch. 4).

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[13] Although Dassbach's exploration is at present directed toward linking generations sharing a common set of historical forces and thereby a common ideology with the cyclical movements of the 40–60 year Kondratieff wave, his argument could as easily be applied to the 25–30 year Kuznets cycle as well (Solomou 1990:157–59).

Eventually, however, the diffusion of the new technologies becomes general. The market becomes saturated in precisely the same fashion as saturation occurs in the Juglar cycle. Parallel with this diffusion comes a decline in profits. Once more, investment shifts away from production and into speculation, while unemployment mounts and effective demand decays. Yet because the whole process is spread out over the entire infrastructure of the economy, its decline also stretches over several Juglar cycles, during which the depressive phases grow longer and the recoveries more anemic (Mandel 1975:Ch. 4).

Kondratieff's original observations were based upon records of prices, and most of the recent works cited above have continued in that tradition, partly because price data are available for sustained periods. In one of the most thorough pieces of new research in this area, Goldstein (1988: 233) concluded that:

> Long waves are tentatively corroborated in prices, production, investment, innovation, and wages (the last two are inversely correlated) but not in trade. They extend from 1495 (at least for prices) through the present. The variables are lagged within cycle time in the following sequence: production, investment, innovation, prices, and wages.

Recent Cycle Research

Most of the work on Kondratieff cycles has used price data (e.g. Berry 1991), although researchers have also examined inventories, consumption patterns, labor strikes, profit rates, and international debt (Gordon 1986, Kowalewski 1994, Poletayev 1993, Shaikh 1993, Silver 1993, Suter 1992). Until very recently (e. g. Kleinknecht et al 1992), less empirical work has been done with data on production, even though there are sound theoretical reasons for believing that the essential engine of the manifold cycles of capitalism lie ultimately in the dynamics of production and accumulation (Mandel 1975, 1980). But that deficit has started to be filled. In a reanalysis of GDP production data on eight European countries, 1850–1979, and a "world" production index originally presented by Bieshaar & Kleinknecht (1984) for 1780–1979, Metz (1992) seems to have found strong evidence of long waves. His contribution lies in omitting the data distorted by the two world wars and substituting in their place interpolated values, combined with a creative application of spectral analysis.

The research into long waves is still young, so there remain important disagreements over relevant data and methods.[14] One of these disagreements is over the best approach to detecting cycles within time series data. One school (exemplified by the works found in Kleinknecht 1992) advocates use of procedures that are variations on spectral analysis, while another [typified by Goldstein (1988), Solomou (1990), and Grimes (1993 and below] examines data series by using percent change between data values (typically referred to as taking "first differences"). Put simply, the first approach starts by taking out any long-term trends in the data series and then ignoring fluctuations outside of the target cycle length; the second does not throw out any information, but assumes that any cycles (regardless of length) will be revealed by the percent change data. Each method has virtues, so a final choice has yet to be settled upon. But unfortunately, the method chosen appears to influence the results—those using spectral analysis typically find Kondratiev-length cycles more often than those using first differences (e.g. Solomou 1990).

An example of the results available from the application of percentages is illustrated below in some recent work by Grimes.[15] Most of the research literature surveyed above has restricted itself to analysis of data from core countries, usually those in Europe. Missing has been the inclusion of data from countries beyond these few. Until recently, such data were not easily available. However, over the decade of the 1980s an important new source of data has been made available in the series of historical statistics compiled and published by Mitchell (1980, 1983, 1985). Brought together in these volumes for the first time are production and output data for all of the countries around the world for which such data were recorded, including many countries in Latin America and Asia for the nineteenth century. Using these data, Grimes computed the average percentage growth rate for available measures of national product at five-year intervals over the period 1790–1988.[16]

Figure 2 illustrates the number of cases available over that time. There is a clear explosion of cases after the massive wave of decolonization following World War II (and the entrée of systematic data gathering by the World Bank),

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[14] An excellent review of the theoretical underpinning of these disagreements can be found in Rappoport & Reichlin 1989.

[15] A more thorough report of this research can be found in Grimes (1993).

[16] Data were collected at five-year intervals on GDP and population for 104 of the largest countries from 1790–1990. For the period 1790–1945, data were obtained from Mitchell (1981, 1982, 1983) and Maddison (1982). For the period 1950–1990, the GDP and population data are drawn from the World Bank. Although data on GDP are not available for every country for all years, the countries for which data exist in the period 1790–1950 include the United States, Mexico, most of Europe, and the largest countries in Latin America and Asia.

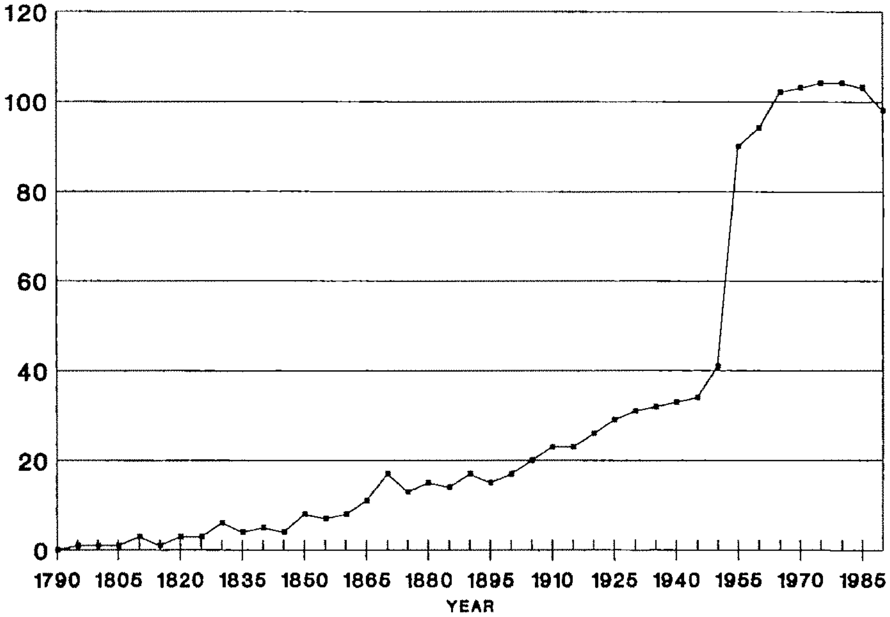

Figure 2 N of cases by year. Countries with data available

but even well before then, Mitchell's data has 20 cases back until 1905, and 10 cases until 1865.

Figure 3 illustrates the average growth rates among the countries measured over the period. Empirically, the pattern of oscillation in their growth is perceptibly the same in both timing and amplitude from 1820 to 1940, even though the number of cases over that same period varies from 3 to 33. This suggests that the proportion of the globe's economic activity indirectly recorded by the small number of countries in the beginning may be far greater than is implied by the size of the list alone. !17

Figure 3 demonstrates that this method of approaching the data shows no obvious support for a Kondratiev-length pattern, but there is strong support

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[17] There are also theoretical reasons to believe that the measured cases can be thought of as proxies for the vast majority of the larger world economy that remains unmeasured. An examination of the list of countries measured shows them to be the USA, France, England, and Germany—precisely the countries which were the leading incubators for emerging industrial capitalism, so it is reasonable to expect their production and trade to be the collective engine powering the system as a whole (Braudel 1984, Wallerstein 1974).

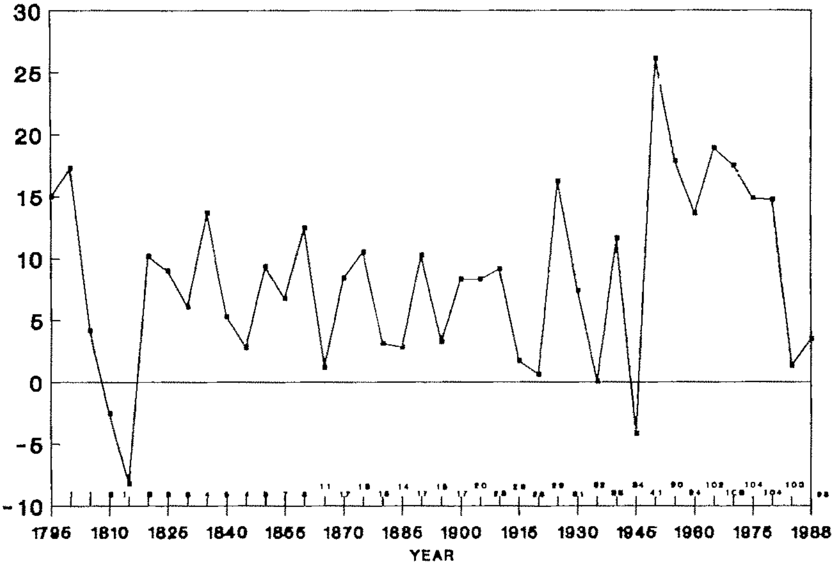

Figure 3 Mean growth rates. GDP/Capita 1795–1988. (N of cases next to relevant year)

for a Kuznets-length oscillation.[18] Despite the global nature of this recorded average, there is a lot of variation between individual countries—not all countries rise and fall together.[19] Further work with these data is needed, especially its submission to the procedures of spectral analysis. At this point the jury on the existence of Kondratievs in production is still out.

It easy to imagine, if there are regular cycles lasting at least one generation (such as the Kuznets) or possibly two (like the Kondratieff), that these oscillations might express themselves socially and politically. Particularly in the case of the latter cycle length, where either phase ("up" or "down") is capable of lasting 20–30 years, then entire generations could come of age during either generalized depression or prosperity, and that this would have political consequences (Dassbach 1993). Research has already shown that general attitudes about the relative importance of economic "well-being" as against economic "equity" are detectably different by cohort and are powerfully affected by the economic circumstances of one's youth (Inglehart 1971). This linkage between cohort attitude and the economic circumstances of childhood has also been demonstrated cross-nationally. Berry (1991), Gordon (1978, 1986), and Mandel (1975, 1980) have all used this observation to suggest that the Kondratieff cycle shapes the timing of "key" elections, as well as the form and timing of class conflict. Yet efforts to test this seemingly clear corollary to cycle research have yielded only equivocal results.

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[18] Not shown here are the results of T-tests on the difference of means for the Kondratieff "up" vs "down" phases portrayed in Goldstein (1988). None were significantly different except for the post-World War II "boom" as compared with the periods before and after it.

[19] In a further analysis of the amount of between-country covariation, Grimes (1993) finds that the synchronization of the world-economy has itself oscillated between a peak in the early nineteenth century, followed by a trough in the mid-nineteenth century, another peak at the turn of the twentieth century, another trough in the aftermath of World War II, rising once again to a sharp peak for the period 1970–1990. The underlying logic (if one exists) to these pulsations is as yet unknown, although they may reflect the influence of the "Hegemonic Cycle" (see below).

One example of this research is provided by the work of Silver using the data generated by the World Labor Research Working Group at Binghamton (1992, 1995). By carefully recording every reference to, or description of, forms of labor unrest throughout the world as found in the *New York Times* or *The Times* (London), she was able to check for correlations between the amount and types of conflict and the long wave over the period 1870 to the present. While there was mild support for a long wave influence on class conflict, it was weak. Instead there was an unexpected match between such conflict and the decentralization phase of the "hegemonic sequence" (see next section). Another example of similar research is that of Kowalewski (1991a–c). Like Silver, he used the *New York Times* and *The Times* (London) to gather reports of political events to check against the pattern of the Kondratieff for the period 1821–1985. But in his case, he looked for reports of revolutionary movements in the periphery, core interventions to suppress those movements, and the frequency of military coups. For the frequency of revolutionary movements and also that of coups, he found a clear upward trend throughout, while for core interventions there appeared to be a gentle upside-down "U" curve, peaking near 1920. But in looking for connections to the generally agreed-upon timing of the Kondratieff, like Silver, he found weak support, but more apparent correlation with the hegemonic sequence—again unexpectedly.

Finally, in other work on Kondratieff waves, Suter's (1992) important study of debt cycles shows that the debt crisis of the 1980s in the periphery and semiperiphery is only the most recent instance of a recurrent cycle of foreign indebtedness characterizing the world economy as a whole. Suter identifies three repeating phases (expansion, crisis, and settlement) that have accompanied four major periods of global debt-servicing incapacity among sovereign borrowers: the late 1830s, the mid-1870s, the early 1930s, and the early 1980s. Suter concludes that debt cycles are regularly related to both Kondratieff waves and Kuznets cycles. Suter's book, recipient of the 1993 Political Economy of the World-System prize for distinguished scholarship, includes case studies of Peru, Liberia, and the Ottoman Empire.

Progress in this kind of research is necessarily slow and extremely labor-intensive, so it may be some time before enough studies accumulate to allow us definitive conclusions. However, at present it would seem that although Kondratievs appear in some important data series, the clear association we would expect to find between political struggles and the pulses of the Kondratieff remain unsupported, while those between such conflict and the hegemonic sequence are somewhat tentative, since the time for which data must be available is so very long.

Hegemonic Sequences

One of the cyclical features that is common to all hierarchical world-systems is a system-wide oscillation between centralization and decentralization of political organization. The distribution of power among a set of polities varies in concentration. In systems of chiefdoms, states, and empires, the size of the largest polity increases and then decreases. In state-based world-systems prior to the predominance of capitalism, these oscillations were manifested as the sequential rise and fall of empires. But in the modern world-system, capitalism has changed the dynamics and the form of the political centralization/decentralization sequence.

In the modern world-system, the pattern of political centralization/decentralization takes the form of the rise and fall of hegemonic core powers. This is analytically similar to the rise and fall of empires, but the differences are important. State-based world-systems prior to the modern one oscillated back and forth between core-wide empires and interstate systems in which the core region contained several states. In some regions the decentralization trend went so far as to break up into mini-states. Thus feudalism may be understood as a very decentralized form of a state-based system.

The simplest structural difference between a core-wide empire and a hegemonic core state is with regard to the degree of the concentration of political/military power in a single state. It is in this sense that Wallerstein's distinction between world-empires and world-economies points to an important structural difference between the modern system and earlier state-based systems. But this is not only a difference in the degree of peak political concentration. The whole nature of the process of rise and fall is different in the modern world-system. The rise and fall of hegemonies has occurred in a very different way from the rise and fall of empires. Empire formation was a matter of conquering and exploiting adjacent core states by means of plunder, taxation, or tribute. The rise of modern hegemons has not occurred in this way. Instead, modern hegemons sought to control international trade, especially oceanic trade, that linked cores with peripheries.

This is why the modern world-system is resistant to empire-formation. The most powerful state in the system acts to block empire-formation and to preserve the interstate system. Thus the cycle of political centralization/decentralization takes the form of the rise and fall of hegemonic core powers. This important difference is due primarily to the relatively great importance that capitalist accumulation has for the modern system.

There is general agreement that certain core states have been able to access disproportionate amounts of political, military, and economic power for prolonged periods averaging about one century. These unusual core states are variously called either "leading" or "hegemonic," because during their dominion they can promulgate and militarily enforce international rules of trade and international relations that favor their status. With the most dynamic economy and often the largest military, the hegemon also disseminates its language, culture, and currency as "global" standards (Chase-Dunn 1989, Goldstein 1988, Modelski & Thompson 1988 and forthcoming). It is also accepted that at some point the transition between the hegemony of one country and that of another is punctuated and affirmed by global war. The key linkage between the hegemonic cycle and war that all students of these issues accept is that the agreements ending any global war ratify the global power hierarchy existing at war's end. Meanwhile, in the generations following the war, uneven investment and development gradually work to reorder the hierarchy in ways unanticipated by the earlier international agreements. Eventually, the disparity between the "actual" hierarchy formed by long-term economic investment patterns and the "formal" hierarchy ratified by the last war grows large enough—and the aging hegemon weak enough—that another member of the core seeks to unseat and replace it by initiating a new war (Boswell & Misra, forthcoming; Goldstein 1988, Modelski & Thompson 1988, forthcoming).[20]

Most other questions remain unsettled: How many core states have been hegemonic and for how long? How have these hegemons become dominant—what commodities did they monopolize? What are the links between economic cycles, wars, and the hegemonic sequence?

Braudel (1984) provides one list of dominant economic "centers" focused on cities: Venice (1378–1498), Antwerp (1500–1569), Genoa (1557–1627), Amsterdam (1585–1773), London (1773–1929), and New York (1929–present) (Braudel 1984, Vol. 3). For him, these "centers" were not "hegemonic" in the sense described above. Rather, they were the sites of the most dynamic economies in their day, locations that acted as midwives to the most important institutional inventions facilitating capitalist development; they were also the trading nodes through which the most advanced products were routed. Others writing since have imposed criteria for hegemony that delete some of Braudel's candidates because they conceptualize hegemony differently. Wallerstein

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[20] The threat of yet another global war in an age of nuclear and biological weapons represents an additional reason to believe that the current world-system is transitory.

(1984a) understands hegemony as a combination of economic power based on the most profitable leading industries and military power. Modelski & Thompson (1988) originally focused on the importance of naval forces that allowed the "leader" to exercise global reach. Their study of changes in the distribution of naval capacity among the "great powers" remains one of the most important contributions to our understanding of the hegemonic sequence. In their more recent work, Modelski & Thompson (forthcoming) see global leadership as based on economic innovations that allow the leader to be central in the leading and most profitable industries in the world economy. Their empirical work on the distribution of shares of the most profitable sectors over long periods of time is very valuable, though the sectors chosen remain somewhat controversial.

Modelski & Thompson (1988, forthcoming) argue that there have been four "global leaders": Portugal (1516–1609), United Provinces of the Netherlands (1609–1714), United Kingdom (1714–1945), United States (1945-?), and they contend that the United Kingdom managed to lead through two "leadership cycles," one in the eighteenth and one in the nineteenth centuries. Wallerstein (1984a) is even more restrictive, admitting into the club of hegemonies only the United Provinces, United Kingdom, and the United States.

The cyclical nature of the rise and fall of these powers strongly implies a linkage with the economic cycles surveyed above. But the nature of this linkage has yet to yield a consensus. Most tie the hegemonic sequence to the Kondratieff cycle, despite its empirical ambiguity. Modelski & Thompson (1988 and forthcoming) are the most explicit in this regard, arguing that each hegemonic cycle encloses two Kondratievs. Goldstein (1988) and Grimes (1988) are more flexible, asserting only that a global war and birth of a new hegemon coincides with a Kondratiev upswing, but that not all upswings are accompanied by war. Boswell & Misra (forthcoming) assert that the relevant cycle governing the hegemonic sequence is not the Kondratiev at all but instead a "Logistic" wave, a wave postulated to have the same dynamic as the Kondratiev—infrastructural innovation eventually giving way to market saturation—but whose period is thought to be roughly twice as long (around 120 years). (See also Arrighi 1994.)

But despite these disagreements, there remains a consensus that the engine driving a rising core state and contender for hegemonic status is that it is the geographical home for the emergence of some revolutionary new technology and related product(s). Such a technology requires a change in basic infrastructure to be fully employed; hence it takes more than one generation to saturate the market. The novelty of these products allows for disproportionate accumulation via technological rents, enabling the aspiring new core to rapidly gain the capital required both for continued investment and military build-up.

There have been important research contributions to our understanding of the hegemonic sequence in the last few years. Taylor's (1994) study of the Dutch hegemony shows that it was the unique combination of the economic policies of city states with the protective capacity of territorial states that enabled the Dutch to perform the role of hegemon and consolidate the interstate system in the seventeenth century. Boswell & Misra's (1994) study of the rise and fall of Dutch control of the sea lanes is another important contribution.

Regarding the US hegemony, Bergesen (1995) has analyzed changes in the distribution of economic power in the world's largest firms to document the US decline relative to the German and Japanese economies. Schott (1994) studied performance, recognition, and centrality in global networks of engineering scientists, especially comparing the United States and Japan. He finds that Japanese performance is surging relative to the United States, but that Japanese recognition remains low, while the United States receives greater recognition than its relatively declining performance would justify. This is a demonstration of how a declining hegemon can rest on its laurels.

Conclusions

Recent research on the modern world-system and comparisons between it and earlier systems continue to challenge the early assumptions of the world-system perspective, forcing students of the area to fine-tune concepts and to produce new theories of long-term social change. Current debates bring to the fore once again the huge questions of historical evolution. Wallerstein (1994:76), commenting on the comparative world-systems project, says,

> What might be a possible fruitful line of enquiry is to compare both the genesis and the terminal crises of systems, to see if there are any patterns, which could then (*a*) give us some insight into "world history," if by that we mean the synchronic unfolding of human social existence, and (*b*) illuminate how system bifurcations (vide Prigogine) work in historical systems, which in turn might help us with (*c*) the practical question of how best to navigate the current bifurcation (or systemic demise, or transformation from one historical system to one or more other such systems).

This potential for world-systems analysis to enable us to understand social change and act in a collectively rational way to avoid predictable disasters (such as global war and environmental collapse) is the most alluring aspect encouraging research in the area. Already we know that our current system is wobbling dangerously close to the edge of growth limits.

As the best unit of analysis for studying social change on a global level, world-systems theory provides social science with a new purchase that can produce a robust and scientific theory explaining both the past and likely future. The notion that long time horizons for historical analysis may lead to superior models of the future is not a new one—it has long been the stuff of eschatology. But today the study of world-systems promises to wrest our expectations about the future away from theology and into the realm of science. In this respect, sociology may now be able to join with other sciences in demystifying the world.

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Literature Cited

Amin S. 1976. *Unequal Development*. New York: Monthly Rev.

Amin S. 1993. The ancient world-systems versus the modern capitalist world-system. See Frank & Gills 1993, pp. 247–77

Anderson P. 1974a. *Passages from Antiquity to Feudalism*. London: New Left

Anderson P. 1974b. *Lineages of the Absolutist State*. London: New Left

Arrighi G. 1990. The three hegemonies of historical capitalism. *Review* 13(3):365–408

Arrighi G. 1994. *The Long Twentieth Century*. London: Verso

Arrighi G, Drangel J. 1988. The stratification of the world-economy: an exploration of the semi-peripheral zone. *Review* 10(1):9–74

Baran P, Sweezy P. 1966. *Monopoly Capitalism*. New York: Monthly Rev.

Bergesen A. 1995. A network analysis of global economic competition, 1956–1989. *J. World-Systems Res.* 1(1) [Electronic journal: locate via GOPHER://CSF.COLORADO.EDU/WSYSTEMS/JOURNALS/]

Berry BJL. 1991. *Long Wave Rhythms in Economic Development and Political Behavior*. Baltimore: Johns Hopkins Univ. Press

Bieshaar H, Kleinknecht A. 1984. Kondratieff long waves in aggregate output? An econometric test. *Konjunkturpolitik* 30(5):279–303

Boli-Bennett J. 1980. Global integration and the universal increase of state dominance, 1910–1970. In *Studies of the Modern World-System*, ed. AJ Bergesen. New York: Academic

Bornschier V, Chase-Dunn C. 1985. *Transnational Corporations and Underdevelopment*. New York: Praeger

Boswell T, Misra J. 1991. The rise and fall of Amsterdam and Dutch hegemony: evidence from the Baltic Sound Tolls, 1550–1750. In *Cities in the World-System*, ed. R Kasaba, pp. 55–80. New York: Greenwood

Boswell T, Misra J. 1995. Cycles and trends in the early capitalist world-economy: an analysis of leading sector commodity trades, 1500–1600/50–1750. *Review* Summer. In press

Bosworth T. 1993. *World cities and economic cycles: testing Barry Gills and Andre Gunder Frank's A and B phases*. Dep. Polit. Sci., Univ. Wash., Seattle. Unpublished ms.

Braudel F. 1984. *Civilization and Capitalism, 15th-18th Century*. 3 Vols. New York: Harper & Row

Braudel F. 1984. *Civilization and Capitalism, 15th-18th Century*. Vol. 3. *The Perspective of the World*. New York: Harper & Row

Braverman H. 1974. *Labor and Monopoly Capital*. New York: Monthly Rev.

Cha Y-K. 1991. Effect of the global system on language instruction, 1850–1986. *Sociol. Educ.* 64:19–32

Chandler T. 1987. *Four Thousand Years of Urban Growth: An Historical Census*. Lampeter, Wales: Edwin Mellen

Chase-Dunn C. 1989. *Global Formation*. Cambridge, MA: Blackwell

Chase-Dunn C. 1990. World state formation: historical processes and emergent necessity. *Polit. Geogr. Q* 9(2):108–30

Chase-Dunn C, Hall TD, eds. 1991. *Core/Periphery Relations in Precapitalist Worlds*. Boulder, CO: Westview

Chase-Dunn C, Hall TD. 1993. Comparing world-systems: concepts and working hypotheses *Soc. Forces* 71(4):851–86

Chase-Dunn C, Hall TD. 1994. *Cross-world-system comparisons: similarities and differences*. Presented at Annu. Meet. Am. Sociol. Assoc., Los Angeles, Aug. 9

Chase-Dunn C, Willard A. 1993. *Systems of cities and world-systems: settlement size hierarchies and cycles of political centralization, 2000BC to 1988AD*. Presented at Annu. Meet. Int. Stud. Assoc., Acapulco, March 25. [Data appendix is available from an electronic archive at Boulder, CO: csf.colorado.edu/wsystems/datasets/citypop/civilizations/citypops_2000bc-1988ad

Chase-Dunn C, Willard A. 1994. Cities in the central political/military network since CE1200: size hierarchy and domination. *Comp. Civiliz. Rev.* 30:104–32

Dassbach C. 1993 *Long waves and historical* *generations: a world system approach.* Presented at Annu. Meet. Int. Soc. Polit. Psychol., 16th, Cambridge, MA, July

DiMatteo M, Goodwin RM, Vercelli A, eds. 1989. *Technological and Social Factors in Long-Term Fluctuations Proc., Siena, Italy, Dec. 1986. Lect. Notes Econ. Math. Syst.* 321

Dixon W, Boswell T. 1995. *Dependency, disarticulation, and denominator effects: another look at foreign capital penetration.* Paper presented at Meet. Am. Sociol. Assoc., Washington, DC, August 1995

Ekholm K, Friedman J. 1982. "Capital" imperialism and exploitation in the ancient world-systems. *Review* 6(1) 87–110

Emmanuel A. 1972. *Unequal Exchange: A Study of the Imperialism of Trade.* New York: Monthly Rev.

Firebaugh G. 1992. Growth effects of foreign and domestic investment. *Am. J. Sociol.* 98(1):105–30

Folbre N. 1977. Population growth and capitalist development on Zongolica, Veracruz. *Latin Am. Perspect.* 4(4):41–55

Foucault M. 1980. *The History of Sexuality,* Vol. I. *An Introduction.* New York: Vintage

Frank AG. 1993. Bronze age world system cycles. *Curr. Anthropol.* 34(4):383–430

Frank AG. 1992. *The Centrality of Central Asia. Comparative Asian Studies,* Vol. 8. Amsterdam: Amsterdam Ctr. Asian Stud.

Frank AG, Gills BK, eds. 1993. *The World System: Five Hundred Years or Five Thousand?* London: Routledge

Freeman C, ed. 1984. *Long Waves in the World Economy.* Dover, NH: Francis Pinter

Gereffi G, Korzeniewicz M, eds. 1994. *Commodity Chains and Global Capitalism* Westport, CT: Praeger

Gimenez ME. 1977. Population and capitalism. *Latin Am. Perspectives* 4(4):5–40

Goldstein J. 1988. *Long Cycles: Prosperity and War in the Modern Age.* New Haven: Yale Univ. Press

Gordon DM. 1978. *Up and Down the Long Roller Coaster. URPE U.S. Capitalism in Crisis.* New York: URPE, Econ. Educ Project

Gordon DM. 1986. What makes epochs? A comparative analysis of technological and social explanations of long economic swings. See DiMatteo et al. 1989, pp. 267–304

Gordon RJ, ed. 1986. *The American Business Cycle: Continuity and Change.* Natl. Bur. Econ. Res. Chicago: Univ. Chicago Press

Grimes P. 1981. *Poverty, exploitation, and population growth. Marxist and Malthusian views on the political economy of childbearing in the third world.* Unpublished. Mich. State Univ.4

Grimes, P. 1988. *Long cycles, international mobility, and class struggle in the world-system.* Unpublished ms.

Grimes P. 1993. *Harmonic convergence? Frequency of economic cycles and global integration.* Presented at Meet. Soc. Sci. Hist. Assoc., Nov. 4–7, Baltimore, MD

Harvey D. 1989. *The Condition of Postmodernity.* Oxford: Basil Blackwell

Inglehart R. 1971. The silent generation in Europe: intergenerational change in post-industrial society. *Am. Polit. Sci. Rev.* 65(4): 991–1017

Kleinknecht A, Mandel E, Wallerstein I, eds. 1992. *New Findings in Long-Wave Research.* New York: St. Martin's

Kondratiev ND. 1979. The long waves in economic life. *Review* 2(4):519–62

Korzeniewicz R, Martin W. 1994. The global distribution of commodity chains. See Gereffi & Korzeniewicz 1994, pp. 67–92

Kowalewski D. 1991a. Periphery revolutions in world-system perspective, 1821–1985. *Comp. Polit. Stud.* 24(1):76–99

Kowalewski D. 1991b. Core intervention and periphery revolution, 1821–1985. *Am. J. Sociol.* 97(1):70–95

Kowalewski D. 1991c. Periphery praetorianism in cliometric perspective 1855–1985. *Int. J. Comp. Sociol.* 32(3–4):289–303

Kowalewski D. 1994. The African periphery in the world system: Kondratieff long waves of exports and indebtedness. *J. Third World Spectrum* 1(1):17–32

Maddison A. 1982. *Phases of Capitalist Development.* New York: Oxford Univ. Press

Maddison A. A comparison of levels of GDP per capital in developed and developing countires, 1700–1980 *J. Econ Hist.* 43:27–41

Mamdani M. 1972. *The Myth of Population Control: Family, Caste, and Class in an Indian Village.* New York: Monthly Rev.

Mandel E. 1968. *Marxist Economic Theory.* New York: Monthly Rev.

Mandel E. 1975. *Late Capitalism.* London: New Left

Mandel E. 1980 *Long Waves of Capitalist Development: The Marxist Interpretation.* New York: Cambridge Univ Press

Marglin SA. 1974. What do bosses do? The origins and functions of hierarchy in capitalist production. *Rev. Radical Polit. Econ.* 6(2):33–60

Marx K. 1967. *Capital.* 3 Vols. New York: Int. House

McNeely CL. 1993. The determination of statehood in the United Nations, 1945–1985. In *Research in Political Sociology,* 6:1–38. Greenwich, CT: JAI

Metz R. 1992. A re-examination of long waves in aggregate production series. See Kleinknecht et al 1992, pp. 80–119

Mitchell BR. 1980. *European Historical Statistics: 1750–1975.* London: Macmillan

Mitchell BR. 1983. *International Historical Statistics: The Americas and Australasia.* Detroit: Gale Res. Co.

Mitchell BR. 1985. *International Historical Statistics: Africa and Asia.* New York: New York Univ. Press

Modelski G, Thompson WR. 1988. *Seapower in Global Politics, 1494–1993.* Seattle: Univ. Wash. Press

Modelski G, Thompson WR. 1995. *Innovation, Growth and War: the Coevolution of Global Economics and Politics?* Columbia: Univ. S. Carolina Press. Forthcoming

O'Conner J. 1973. *The Fiscal Crisis of the State.* New York: St. Martin's

Polanyi K, Arensberg CM, Pearson HW, eds. 1957. *Trade and Market in the Early Empires.* New York: Free

Poletayev AV. 1992. Long waves in profit rates in four countries. See Kleinknecht et al 1992, pp. 151–67

Raffer K. 1987. *Unequal Exchange and the Evolution of the World System.* New York: St. Martin's

Schneider J. 1977. Was there a precapitalist world-system? *Peasant Stud.* 6(1):20–29. Reprinted in Chase-Dunn & Hall 1991

Schott T. 1986. Models of dyadic and individual components of a social relation: applications to international trade. *J. Math. Sociol.* 12(2):225–49

Schott T. 1994. Emerging and declining centers of engineering science: Japan and the United States. *Knowl: Creat. Diffus. Util.* 15(4)

Seccombe W. 1983. Marxism and demography. *New Left Rev.*137:22–47

Shaikh A. 1993. The falling rate of profit as the cause of long waves: theory and empirical evidence. See Kleinknecht et al 1992, pp. 174–94

Silver B. 1992. Class struggle and Kondratieff waves, 1870 to the present. See Kleinknecht et al 1992, pp. 279–95

Silver B. 1995. World-scale patterns of labor-capital conflict: labor unrest, long waves and cycles of hegemony. *Review* 18(1):53. In press

Singer F. 1971. Human energy production as a process in the biosphere. In *Energy,* ed. F Singer, pp. 163–72 New York: Sci Am / Freeman

Smith DA, White D. 1992. Structure and dynamics of the global economy: network analysis of international trade, 1965–1980. *Soc. Forces* 70(4):857–93

Solomou S. 1990. *Phases of Economic Growth: 1850–1973.* London: Cambridge Univ. Press

Star C. 1971. Energy and power. In *Energy,* ed. F Singer, pp. 8–21. New York: Sci. Am./ Freeman

Strang D. 1990. From dependency to sovereignty: an event history analysis of decolonization 1870–1987. *Am. Sociol. Rev.* 55(6): 846–60

Suter C. 1992. *Debt Cycles in the World-Economy: Foreign Loans, Financial Crises and Debt Settlements, 1820–1990.* Boulder, CO: Westview

Taylor PJ. 1994. Ten years that shook the world: the United Provinces as first hegemonic state. *Sociol. Perspect.* 37(1):25–46

Terlouw CP. 1992. *The Regional Geography of the World-System: External Arena, Periphery, Semiperiphery, Core.* Utrecht: Faculteit Ruimtelijke Wetenschappen, Rejksuniversiteit Utrecht

Thomas B. 1954. *Migration and Economic Growth.* London: Cambridge Univ. Press

Thomas GM, Meyer JW, Ramirez F, Boli J. 1987. *Institutional Structure: Constituting State, Society and the Individual.* Beverly Hills, CA: Sage

Thompson WR. 1992. Systemic leadership and growth waves in the long run. *Int. Stud. Q.* 36(1):25–48

Tilly C. 1989. *Coercion, Capital and European States, AD 990–1990.* Cambridge, MA: Blackwell

Van Duijn J. 1983. *The Long Wave in Economic Life.* London: Allen Unwin

Wallerstein I. 1974. *The Modern World-System,* Vol. I. New York: Academic

Wallerstein I. 1984a. The three instances of hegemony in the history of the capitalist world-economy. In *Current Issues and Research in Macrosociology. Int. Stud. Sociol. Soc. Anthropol.* ed. G Lendski, 37:100–8. Leiden: Brill

Wallerstein I. 1984b. *Historical Capitalism.* London: Verso

Wallerstein I. 1994. Hold the tiller firm: on method and the unit of analysis. *Comp. Civiliz. Rev.* 30.72–80

Wilkinson D. 1987. Central civilization. *Comp. Civiliz. Rev.* 17:31–59

Wilkinson D. 1991. Cores, peripheries and civilizations See Chase-Dunn & Hall 1991, pp. 113–66

Wilkinson D. 1992 Cities, civilizations and oikumenes. I. *Comp. Civiliz. Rev.* 27:51–87

Wilkinson D. 1993. Cities, civilizations and oikumenes II. *Comp. Civiliz. Rev.* 28:41–72

Worldwatch. 1994. *State of the World: A Worldwatch Institute Report on Progress Toward a Sustainable Society,* ed. L Brown. New York: Norton

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IMMIGRATION AND ETHNIC AND RACIAL INEQUALITY IN THE UNITED STATES

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ABSTRACT

This review examines research about current levels and recent changes in ethnic and racial stratification in the United States. Research about ethnic inequality emphasizes that economic stagnation and restructuring are troubling impediments to progress toward equality, and it shows evidence that employers may still use racial and ethnic queues in hiring. A number of issues arise with respect to the incorporation of the new waves of immigrants who have arrived since immigration law reform in 1965. We discuss patterns of adaptation of new immigrants, including available evidence on the ethnic enclave economy and substitution in the labor market of immigrants for native minorities. We summarize new theories and hypotheses about the fate of the children of recent immigrants, and we point to topics in this area needing further research.

The half century since the close of World War II has seen numerous changes to the face of racial and ethnic inequality in the United States, while the problem of inequality has endured. When Myrdal published *An American Dilemma* (1944), the segregationism tolerated by Plessy v. Ferguson was the law of the land, and caste-like barriers separated blacks from whites. Myrdal's chief task was to comprehend the vicious circle that perpetuated these rigid distinctions between the races. By contrast, when Warner & Srole (1945) described the ethnic

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structure of a representative American city, they described the patterned relationships among its various European national descent groups. The variable these authors used to explain the unequal standing of these groups was the relative lapse of time since each group had migrated to the United States—time for initial distinctions among European descent populations to be erased through homogenization of the social positions of members of different groups.

In the intervening five decades, ascriptive inequality has been transformed by several interrelated events. The economic growth of the postwar decades formed the backdrop for a period of both legal and substantive changes in racial and ethnic inequality in the United States. The formal disabilities of Jim Crow separatism were dismantled by court decisions and by legislative action. Differences between blacks and whites on education and income narrowed. These changes, together with rising general levels of prosperity, created for the first time a substantial black middle class. At the same time, the open opportunity structure created by the expanding economy eased the incorporation of the children and grandchildren of members of the waves of migrants who had flooded to the United States from Europe before and during the early decades of the century.

Yet the story of changing inequality is not a Pollyanna-ish tale. At the close of the twentieth century, group differences have changed shape rather than disappeared. The background of these changes is the changed economic position of the United States. The rapid pace of economic growth in the immediate postwar period could not be sustained after the 1960s, stalling further progress toward racial equality. The export of manufacturing employment has put particular pressure on workers at the lower end of the education distribution where members of racial minority groups are overrepresented. An era of diminished expectations has thrown into relief the continuing relevance of race to economic opportunity.

The new global order has changed the racial and ethnic map of the United States one further way. Immigration has had a very large impact on American society since the 1960s, and most especially it has increased the diversity of the nonwhite population of the United States. In 1990 7.9% of the US population was foreign born. The 19.8 million foreign-born people in the United States is the largest number in US history. The sources of immigration flows have also shifted as a consequence of changes in immigration law and in the international pattern of migration flows. In 1990, 25.2% of the foreign-born population was Asian, 42.5% Latin American, 22% European, and 10.3% from other countries. The decade of the 1980s produced a large number of immigrants; 44% of the total 1990 foreign-born population arrived in that decade (Bureau of Census 1993).

In this paper, we review recent literature assessing the impact of three factors—economic restructuring, racial discrimination, and immigration—on the current patterns of racial inequality in the United States. Because of the enormous impact of immigration on the composition of America's nonwhite populations, we stress the importance of combining analyses of the economy and of racial and ethnic discrimination, along with the new evidence we have about immigrant absorption and change.

RACIAL AND ETHNIC CATEGORIES

Scholars who study ethnicity are in general agreement that racial and ethnic categories are social constructions rather than natural entities that are simply "out there" in the world. This constructed character of ethnic groups has several implications for research. One is that the categories the analyst uses are bound to be arbitrary. For example, Office of Management and Budget (OMB) Directive 15 specifies whites, blacks, Hispanics, Native Americans, Asians, and Pacific Islanders as racial and ethnic categories for purposes of enforcement of civil rights legislation. In fact, this is an arbitrary classification scheme which may owe its high level of recognition to Directive 15 itself. Each aggregation includes subpopulations that are themselves diverse, both in the social and cultural organization of sending countries and in the average experiences of group members in the United States. For example the term "Asian" covers the experiences of so-called "model minorities" like the Japanese and Koreans who have high socioeconomic standing in the United States, as well as Southeast Asian populations that have experienced more difficulties.

There are no easy methodological solutions to this problem of classification, except for the recognition of the arbitrariness of any set of ethnic categories. We concentrate on the OMB minority groups in this paper—paying close attention to the distinct subpopulations that make up each aggregation. We do not survey the important literature on white ethnic group inequality because of space limitations. (For a good overview, see Alba 1990, Lieberson 1980, Lieberson & Waters 1988, Hirschman 1983.)

For most racial and ethnic populations in the United States, classification problems also arise because of the progress of amalgamation and assimilation. The significant exception remains African Americans. Because of the rigidity of the boundary between blacks and whites, few definitional problems arise: rates of intermarriage between blacks and others have historically been low. Even with recent increases, in 1983–86, only 5% of African American males had marriages involving white spouses, and 2% of African American females had white spouses (Kalmijn 1993). Further, the common use in the United States of the rule of hypodescent (the one-drop rule) to classify persons of remote black African descent as African American reduces ambiguity about the boundaries of this population (Davis 1991).

At the other extreme, white ancestry groups have experienced extremely high rates of intermarriage with one another, so that many members of the conventional European national descent populations are of mixed ethnic descent. Scholars have debated whether the patterns of intermarriage and ambiguity about identity among white ethnics mean that assimilation theory accurately portrays the fate of the European descent ethnicities (Greeley 1974, Gans 1979, Alba 1990).

Intermarriage may be especially important in the future evolution of ethnic categories that are neither European nor African. As we discuss in this review, current conditions of incorporation may sustain the structural segregation and the social significance of ethnic descent for these other groups that on average are much greater than for European Americans, but much less than for African Americans.

American Indians, for example, remain the most disadvantaged of major American ethnic categories on census measures of poverty and educational attainment. The persistence of the social significance of a Native American ethnic category 500 years after Columbus's voyage is evidence that ethnic distinctions may in some cases be durable. Yet one of the mechanisms that has sustained the distinctiveness of American Indian communities has been the spinoff of many migrants from these communities into the general American population. Because of the subsequent amalgamation and assimilation of many of these off-reservation migrants and their descendants, far more of the descendants of the inhabitants of North America self-identify as whites rather than as American Indians (Snipp 1989, Eschbach 1995). Thus the assimilation process walks hand in hand with the maintenance of ethnic boundaries.

New immigrant populations from Asia and Latin America may well experience processes of incorporation into the United States that will create considerable confusion about who is a member of a given ethnic population. Data from 1990 showed that because of intermarriage "about one quarter of the 2 million children with at least one Asian parent, and of the 5.4 million with at least one Hispanic parent live in inter-racial households with a white parent or step parent" (Harrison & Bennett 1995: 40). These percentages will be likely to increase in subsequent generations of descendants. Available evidence suggests that Americans do not consistently use the rule of hypodescent to classify persons of part-Hispanic or part-Asian descent with the 'minority' component of their descent (Davis 1991); ethnic self-identification is inconsistent in these mixed descent populations (Harrison & Bennett 1995).

These facts suggest the need for considerable caution in making comparisons of different racial and ethnic populations. At any given cross section, different immigrant-ethnic populations will be at different stages of incorporation into the United States population and will be different in the degree to which they are composed of ethnically mixed stock. Differences in the process of amalgamation and subsequently in the formation of ethnic identity may form an important component of the explanation of the size and socioeconomic composition of different groups (Hout & Goldstein 1994). The social scientific analyst of patterns of ethnic inequality is ill-advised to overlook the transitory quality of the most basic ethnic categories.

BASIC DATA ON INEQUALITY

With this caveat in mind, Table 1 provides information, based on data from the 1990 census, on median family income, labor force participation, and poverty rates for the major minority groups and whites in the United States. These data show the continuing inequality among American minority groups, when compared with whites. Of the major racial/ethnic minorities in the United States, only Asians have a higher median family income than do whites, with an income of $41,583, compared to $37,630 for non-Hispanic whites. Amer-

Table 1 Selected socioeconomic indicators for groups in the United States, 1990

Ethnic racial groups	Median family income, 1989	Percentage persons in poverty	Labor force participation[a] (%)
White not Hispanic	$37,630	10	65
Black	22,430	29.5	63
American Indian[b]	21,750	30.9	66.1
Hispanic	25,064	25.3	67.5
Mexican	24,119	26.3	68.3
Puerto Rican	21,941	31.7	60.4
Cuban	32,417	14.6	65.0
Asian	41,583	14.0	67.4
Japanese	51,550	7.0	64.5
Chinese	41,316	14	65.9
Filipino	46,698	6.4	75.4
Korean	33,909	13.7	63.3
Asian Indian	49,309	9.7	72.3
Vietnamese	30,550	25.7	64.5
Cambodian	18,126	42.6	46.5
Hmong	14,327	63.6	29.3
Laotian	23,101	34.7	58.0

[a] Persons 16 years and over in labor force

[b] Includes Eskimos and Aleuts

Source U S Census of Population, 1990, Social and Economic Characteristics CP-2-1, Washington, DC, U S Government Printing Office, 1993 ican Indians have the lowest median income with $21,750, followed closely by blacks and Hispanics. Data on unemployment follow this general pattern, with blacks and American Indians the worst off, followed by Hispanics. Asians have unemployment rates comparable to whites. Poverty rates also follow this general pattern, with blacks showing a poverty rate for individuals that is three times the rate for whites.

Measurement Issues

These simple rankings mask a more complex picture. The most important variables used to decompose these overall patterns are subethnic groups, gender, and family and household composition. Panethnic groupings such as black, Hispanic, and Asian mask very important differences among subgroups, which we explore further in this review.

There are also important gender differences in relative success of members of these groups—in general, women from minority groups look better in comparison to white women than do minority men compared with white men. So too, family structure is an important variable affecting the levels of success or poverty that a group experiences. For instance, while rates of unemployment and income are much less favorable for blacks and Puerto Ricans than for whites, some of those differences lessen when only husband-wife families are compared across the groups; but because blacks and Puerto Ricans have more families headed by single females, they have lower overall income and success rates. Asians tend to have households with more workers in them than whites; thus when household and family incomes are compared, Asians look better off than when per capita income is compared.

Because of the differences in overall demographics of the groups, as well as differences in the levels of education and other human capital that groups have because of differential migration or the legacy of past inequality and discrimination, sociologists and economists interested in understanding the causes and consequences of racial/ethnic inequality also look at the net returns to human capital for different groups. Using statistical controls, they ask whether a given person with the same background characteristics, such as level of education, region of residence, gender, marital characteristics, has the same earnings as a statistically equivalent person from a different ethnic/racial group. The differences in these returns of earnings for human capital characteristics are variously interpreted as proof of some sort of market inequality or, often, as evidence of discrimination.

In addition to measuring income differences, an important difference across groups involves labor force participation, as well as unemployment. Researchers who focus only on earnings or income differences across groups miss differences in overall socioeconomic outcomes that come about because laborers are discouraged in the labor market or are unable to participate. Thus comparing income and earnings between groups will miss some of the causes of black poverty, given that black men have a labor force participation rate 8% lower than that of whites, and their participation is appreciably lower than that of all other groups except for American Indians. The labor force participation rate includes in the denominator individuals who are actively employed, who have a job but are not currently at work, and those who are looking for work. It can be affected by different cultural norms and values regarding women working outside the home, the age structure of a population, the overall health and disability prevalence across a population, and other factors not necessarily measuring "willingness to work." However, as a gross indicator, it tells us something about attachment to the labor force and the discouragement of workers.

In addition, monetary inequality is not the only measure of the lack of equality of outcomes in our society. There are other ways to measure inequality among racial and ethnic groups that we do not have the space to review here, including health and demographic measures such as infant mortality rates, life expectancy, morbidity, and disability. Ethnic and racial groups also differ in rates of home ownership, residential segregation, overall wealth, exposure to crime and toxic pollutants, and in access to power in the upper reaches of our society. In this article we concentrate on income inequality, recognizing that this does not tell a complete story.

THE SITUATION OF BLACK AMERICANS

How has this current pattern of inequality emerged? The story is somewhat different for the different ethnic categories, because of the varying histories of the groups. For black Americans, the removal of formal legal segregation in the 1960s, along with the rising economic prosperity in that decade, brought rises in weekly or hourly earnings and increased education and returns to education. However, these promising trends have been coupled with changes in family structure that have led to the deterioration of household income for women and children in single-parent families. Growing rates of black male joblessness mean that rising earnings are distributed over a narrowing portion of the potential labor force. Recent developments raise no particular optimism that the wage gains that occurred into the 1970s will quickly eradicate group differences. Economic restructuring in the context of global competition helps to create structural barriers to improvement of the situation of persons with the least education and fewest skills to offer to employers. In addition, evidence suggests that racial discrimination remains an obdurate problem for African Americans regardless of social and economic class.

In 1940, 92% of blacks were poor; by the early 1970s the black poverty rate had declined to 31% (Farley 1993). The relative black/white odds of being in poverty fell from more than 6:1 in 1930 to less than 4:1 in 1985 (Jaynes & Williams 1989). Smith & Welch (1989) estimated that the annual earnings in constant 1987 dollars for a full year, full-time black male worker, inferred from weekly earnings, rose from just under $5000 in 1940 to more the $20,000 in 1980, and that black male wages rose from 43% to 73% of white male wages in this same period. The ratio for actual annual earnings, given differences in labor supply, in 1980, however, was somewhat less at 62% (Farley & Allen 1987).

Economic growth was a primary engine for improving the economic status of both blacks and whites from the end of the depression through the early 1970s (Jaynes & Williams 1989, Smith & Welch 1989, Farley 1993). Decompositions of changes in black-white differences show that the lion's share of the explanation for the narrowing of the wage gap for males is attributable to the narrowing in the education gap between blacks and whites, and to declines in the racial disparity in earnings as returns to schooling (Smith & Welch 1989, Farley & Allen 1987). Concentration in the south also had a smaller depressive effect on black earnings in 1980 than in 1940, because of redistribution of the black population from the south, but even more because of declining regional wage disparities and racial disparities within the south (Smith & Welch 1989). White and black distribution to occupations also became more similar across this period. Jaynes & Williams (1989) reported that from 1950 to 1982, because of shifts in the American occupational structure, the percentage of white men in professional or managerial positions increased from 20% to 32%, and for black men from 6% to 20%.

The story about transformations affecting women is different. In 1940, black women had higher rates of labor force participation and employment than did white women. Using census data Farley (1993) estimates that, based on 1940 employment rates, black women have been employed for 14.5 of their 40 years between ages 25 and 64, compared to just 8.8 years for white women. Increases of labor force participation by both black and white women led to increases in years in employment for both groups thereafter. By 1991, Bureau of Labor Statistics data showed that white women's years in employment during these ages would be 24.4 years, compared to 23.7 years for black women. By 1980, earnings ratios had closed for women in most education categories; for women with college degrees the earnings of black women exceeded those for white women (Farley 1993). However preliminary analysis of CPS data for the years 1969 to 1987 by M. Corcoran and S. Parrott (unpublished paper) found that white women's wages grew more rapidly than black women's wages after 1977. Corcoran & Parrott suggest that as the labor force participation of white women increases, advantages of black women deriving from unmeasured differences in labor force attachment may disappear, unmasking a racial wage gap among women.

The economic gap between blacks and whites seems unlikely to close soon because the American economy seems to have stalled well short of the mark that would allow full equality. The impact of economic restructuring is particularly acute for those at the bottom of the education and skill distribution where blacks are overrepresented. Many scholars point to declines of middle level jobs (Harrison & Bluestone 1988), the redistribution of manufacturing jobs away from the central cities where many jobless blacks live (Sassen 1988), and the rise of earnings inequality among workers of all races (Danziger & Gottschalk 1993) as causes for pessimism about the prospect for rapid future narrowing of the racial gap.

One manifestation of these changes may be that gains in earnings have been offset by a growing racial disparity in joblessness (unemployment and nonparticipation in the civilian labor force) between black and white men (Moss & Tilly 1991). In part, this increased joblessness reflects the substitution by young black men of "good" activities such as military service and education for work (Mare & Winship 1984, Smith & Welch 1989). Yet there is a trend toward relatively high rates of joblessness and nonparticipation in the labor force for African American males even at older ages (Smith & Welch 1989, Jencks 1991). Changes in the social fabric of some African-American communities, partly a consequence of the narrow opportunity structure for many African Americans, help to perpetuate structural barriers to improvement in the well-being of African Americans. Growing rates of female headship in African-American families have increased racial disparity in incomes and may create difficulties in the socialization of the next generation.

Female headship has been increasing for both black and white families, but especially for blacks. In 1940, 20% of black families with children under 18 were headed by women; by 1990 this figure had increased to 52%. For white families over the same period, families headed by women increased from 8% to 17% (Farley 1993). Because female headship is associated with high rates of poverty, this increase in female headship for blacks has expanded somewhat the disparity in poverty rates for white and black families. Farley estimates that if the 1960 distribution of family type had held in 1980, black poverty rates would then have been 26% rather than the observed 33%. Bane (1986) estimated that in 1983 differences in household composition accounted for 44% of the difference in overall poverty rates between blacks and whites. However, Bane also cautioned that such decompositions could partially be artifacts of selection into household type, and particular caution was advised in the interpretation of trend data.

One important line of research associated with William Julius Wilson (1987) has focused in particular on the effects of these changes on African Americans who live in areas of concentrated poverty in the central city core of metropolitan areas. On the employment side these subpopulations suffer from a lack of education and skills and a mismatch between their urban location and the relocation of employment opportunities outside of cities (Kasarda 1985, Wilson 1987). On the social side, Wilson suggests that neighborhood concentrations of the most disadvantaged black populations have propagated destructive attitudes and behaviors that perpetuate the disadvantage, such as high rates of teenage childbearing, female family headship, drug use, illegal market activity, and detachment from the labor force.

A large research literature attempts to model the impact of these "neighborhood" effects—net of personal characteristics—on destructive behaviors and poor social and economic outcomes. These studies have shown inconsistent and generally relatively minor effects (Brooks-Gunn et al 1993, Crane 1991). (For a good overview see Jencks & Mayer 1990.)

While the emphasis in much of the literature on the social and economic impacts of economic restructuring on the most disadvantaged blacks has considerable justification, Jencks (1991, 1992) reminds us that the population that suffers from the full range of problems associated with the concept of the urban underclass is relatively narrowly circumscribed.

Despite the gains that have been made by some middle class and working class blacks in recent decades, there is a strong body of evidence that discrimination remains an important part of the explanation of black-white inequality. Farley & Allen (1987) show that for a black male there is still an earnings disadvantage at all levels of economic attainment. From studies testing the reaction of employers to job applicants of different races, Kirschenman & Neckerman (1991) find strong evidence of direct racial discrimination at the point of hiring by white employers. Feagin & Sikes (1994) show that the experience of racial hostility is routine for African Americans across social classes. These studies suggest that the fact that a particularly heavy share of the burden of current economic changes is borne by poor African Americans is not simply an artifact of the uncompetitive labor market position of many black workers; the civil rights revolution has by no means eradicated racial discrimination in American social and economic life.

AMERICAN INDIANS, HISPANICS, AND ASIANS

Questions sometimes arise about the prevalence and importance of discrimination to the employment and earnings of Hispanics or Latinos, Asians, as well as Native North Americans. Peoples in these categories are often categorized together with Americans of African descent as peoples of color, or racial minorities, though this attribution is particularly ambiguous for many Latino and Indian Americans given the large volume of intermixing between European and indigenous American peoples. What are the patterns of earnings inequality compared to the white population, and what costs does ascriptive discrimination impose, given the historical importance of color consciousness in the United States?

Studies of the labor market experiences of Hispanics as a whole, and of the different subgroups, find that while Hispanics are disadvantaged in the labor market compared to whites, only Puerto Ricans are as severely disadvantaged as blacks and American Indians. Although, overall, Asians have a higher median family income than do American whites ($41,583 vs. $37,630) in 1990, there is a great deal of variation among the subgroups. They range from the severely distressed Hmong population with a median family income of $14,327, a poverty rate of 63.6%, and a labor force participation rate of 29.3% to the successful Japanese with a median family income of $51,550 and a poverty rate of only 7%. The longer established Chinese, Japanese, Filipino, and Asian Indians are doing well—better than the white non-Hispanic average. However the Southeast Asian refugees from Laos, Cambodia, and Vietnam are not achieving as well.

What explains this pattern of variation? Multivariate earnings models suggest some evidence of wage and employment discrimination against Hispanics, Native Americans, and Asians, but that it is less important factor than in the case of blacks. For many Asian groups, of course, there is no pattern of net disadvantage to explain, though this result is compatible with the finding of discrimination in returns to education and other human capital attributes. For many Latino groups, problems in the United States reflect in part the attributes of the migrant pool. At a migrant's destination, his/her poor human capital characteristics interact with the effects of American economic restructuring to perpetuate disadvantages. For Asians and Latinos, the characteristics of immigrants and their absorption into the country are an integral part of the story. The regional concentrations and different modes of incorporation of the different subgroups as well as their differing times of arrival and social class backgrounds also help to explain variations in outcomes (Portes & Truelove 1987, Nelson & Tienda 1985, Bean & Tienda 1987). We turn now to an examination of these groups in detail.

American Indians

The poorest of all the groups in the United States is also the group least influenced by immigration. In 1990, the Census counted 1.96 million American Indians and Alaskan Natives, which makes this the smallest of the four conventional minority categories in the United States. It was also among the poorest—a condition that has been noted by researchers historically (Meriam 1928, Brophy & Aberle 1966, Levitan & Hetrick 1971). This poverty has been associated with the underdevelopment of many reservation communities because of their geographical isolation, lack of resources, and political domination by federal authorities (Cornell & Kalt 1990, Snipp 1986, Trosper 1994, White 1983).

Earnings models for Indians confirm sharp wage disparities between Native Americans and white Americans. These are primarily attributable to large differences in human capital. Scholars disagree about whether the data show discrimination effects (Gwartney & Long 1978, Trosper 1974, Sandefur & Scott 1983).

One difficult theoretical and policy question about Indian reservation communities concerns the impact of residence on reservations on earnings disadvantages. Standard migration models would anticipate labor outflows exceeding those observed from these resource-poor rural enclaves. For other ethnic populations concentrations of disadvantaged group members such as those found on reservations might be considered evidence for the existence of imposed barriers to exit; for Indian tribes these are taken as an expected consequence of sovereignty. However, using data from the question as to place of residence five years ago on the 1980 census, Snipp & Sandefur (1988) could not find consistent earnings returns to migration from reservation areas.

Hispanics

In 1990, persons of Mexican origin formed the largest Hispanic group, numbering nearly 13.5 million persons. Puerto Ricans were the second largest with 2.7 million living on the mainland. There were slightly more than 1 million persons of Cuban origin. There were 5.1 million persons in the composite "Other Hispanic" category, including mostly Central and South Americans and other Caribbean people. Dominicans were the largest group within this category with over 500,000 people.

The outstanding theme characterizing the heterogeneity of Latinos is that Puerto Ricans do exceptionally badly in terms of employment and income, and Cubans do exceptionally well. Puerto Ricans are legally US citizens; they are concentrated in the industrialized northeast and work in industrial jobs. They have the highest proportion of persons living in poverty, show increasing withdrawal from formal labor markets, and have the highest rates of any Latino group of welfare dependency and family disruption (Morales & Bonilla 1993).

Mexicans have high labor force participation rates, but partly because of their lower overall educational attainment, they work for very low wages. Some of them are illegal immigrants, thought to be a docile and pliable work force, and so preferred by employers.

Many of the Cubans are political refugees, and a large number of them are concentrated in the city of Miami where they have created an enclave economy that provides employment opportunities for other Cubans, even those who speak little English or who are new arrivals (Portes & Bach 1985).

DeFrietas (1985, 1991) shows that unemployment and earnings differentials between Hispanics and non-Hispanics depend mostly on differences in worker characteristics. Both Reimers (1985) and Abowd & Killingsworth (1985) conclude that unequal educational attainment is the major determinant of the observed wage gap. The evidence on educational attainment shows Latinos doing poorly relative to other groups. Comparing college completion rates, Morales & Bonilla (1993:12) note that between 1980 and 1990 the white population increased college enrollment from 31% to 39%, African Americans from 28% to 33%, while Latinos remained level at 29%. However, Harrison & Bennett (1995) argue that the popular press reports of a crisis in education for Hispanics are overblown. They argue that "native born Hispanics are almost as likely to complete high school as blacks and American Indians; the very low percentage of Hispanic immigrants with high school diplomas reduces the completion rates of the group as a whole."

Standard multivariate studies of economic attainment of Hispanic men and women do show evidence of discrimination. Stolzenberg (1990) found, using the 1976 Survey of Income and Education (SIE), that Hispanics who speak English well and who have completed high school have returns to schooling about equal to white non-Hispanics. However, he did find that less educated Hispanics do have less return to their education than do statistically comparable non-Hispanic men. DeFrietas (1991) used 1980 census data on income in 1979 and found a gap of 10% or more between Hispanics and non-Hispanics after controlling for age, education, English language ability, nativity, and State/Metro residence. The Urban Institute found additional evidence of discrimination against Hispanic job applicants in an audit study of employers in Chicago and San Diego (Kenney & Wissoker 1994).

According to Morales & Bonilla (1993) changes in the American economy in the last few decades have hit Latinos particularly hard because of their low educational attainment and their labor market positions. Earnings for Latino men, controlled for inflation, actually dropped in the period between 1978 and 1987; in constant dollars they earned an average $49 per year less in 1987 than in 1978. Morales & Bonilla attribute part of this decline to the erosion of the minimum wage and the fact that 23.8% of Latino men were minimum wage workers.

Carnoy et al (1993), using 1980 census and Current Population Survey data from 1982, 1985, and 1987, found a decline in Latino relative incomes for both males and females in the 1980s. They argue that the relatively favorable trends in convergence between Latino and white earnings in the 1960s and 1970s were due to educational increases and a shift in employment from agriculture to manufacturing. They attribute the recent declines to increased numbers of immigrants with low education and English ability and the concentration of Latinos in low-paid service jobs and to the decline of higher-paid manufacturing jobs. Harrison & Bennett (1995) used a 1990 census data to find that some

Hispanic men continue to earn less than comparably educated white men. Hispanic men with less than an associate degree earned only 76% of what white males with equivalent education earned.

The recent trends for women Hispanics as with other women minorities are better than the trends for men. Harrison & Bennett (1995) found that among all education levels, except among selected cohorts either without high school diplomas or with associate degrees, Hispanic and non-Hispanic white women have achieved parity in earnings. More detailed analyses should be done with 1990 census data for specific Hispanic groups because studies done with earlier data show strong differences by national origin. Reimers (1985), using 1976 SIE data, found that Central and South American men received wage offers 36% below those for white non-Hispanic men; the differential was 18% for Puerto Rican men, 12% for Other Hispanics, and 6% for Mexicans. Cubans, by contrast, showed a 6% advantage over white non-Hispanics with a similar background.

Scholars have paid particular attention to the puzzle of high poverty rates and declining labor force participation among Puerto Ricans, despite the "advantage" of US citizenship. The concentration of Puerto Ricans in declining manufacturing jobs, and the possibility of more virulent discrimination against Puerto Ricans of darker complexions are possible explanations, along with the availability of means tested transfer payments, the growth of households headed by women, and the growth of circular migration (Bean & Tienda 1987, Tienda et al 1992).

Because in 1990 35.8% of Hispanics were foreign born, the question of how the new immigrants are affecting the overall standing of Hispanics as a whole and of the different subgroups is an extremely important one. Factors such as changing migration streams, the proportion of workers who are undocumented, and particular economic strategies of the foreign-born affect the overall profile of the different groups.

In the 1980s the group "Other Hispanic" grew at a fast pace through immigration. This growth also contributed greatly to the heterogeneity of the Hispanic population. Many Central Americans from countries like El Salvador, Guatemala, and Nicaragua as well as Caribbean immigrants from the Dominican Republic tend to have limited educations, high poverty rates, and low median family incomes. South American immigrants from countries like Colombia, Peru, and Bolivia have much higher educational attainment, lower poverty rates, and higher incomes.

Undocumented workers, who are disproportionately Latin American, differ from legal immigrants in ways that also reinforce the low income profile of the group. Borjas & Tienda (1993:712) examined the employment experiences and wages of undocumented workers who applied for and received legalization under the 1986 IRCA amnesty program. They found that the legalized immigrants had higher rates of labor force participation than did the foreign-born population as a whole, exceeding those rates by 5% for men and 17% for women. Undocumented workers earned lower wages than legal immigrants—they earned 30% less than their legal counterparts from the same regional origins.

Asians

Asian Americans are the fastest growing minority group in the country. The Asian American population doubled in size in the 1980s and now totals 6.9 million, an increase from 1.5% to 2.9% of the total US population. This growth was due in great part to immigration. Of Asian Americans 66% were foreign born in 1990, and 28% of all Asian Americans entered the United States between 1980 and 1990. Southeast Asians from Vietnam, Laos, and Cambodia had the highest percentages of foreign-born, around 79%. Japanese had the lowest at 32.4% (Bureau of Census 1993).

Those people classified as Asian in the census and other sources come from a number of different countries with different cultures, languages, and histories. Within national origin groups there are also differences in social class background, timing of arrival, and labor market opportunities (Yamanaka & McClelland 1994:82).

Part of the explanation of Asian socioeconomic achievement lies in their greater-than-average educational attainment. The lower incomes and higher poverty of Southeast Asians are largely attributable to the much lower average educational attainment of members of these groups. While 23.3% of the total US male population had a college degree or higher, 48.7% of Asian Indian men, 41.6% of Filipino men, and 35% of Chinese men were college graduates; among Cambodians, Hmong, and Laotians, only 3% of men had a college degree or higher. Harrison & Bennett (1995) report that Asians were about two-thirds more likely to have completed college than whites.

This high educational attainment is partly a result of Asian immigration selectivity. Many Asians enter under highly selective immigration criteria. Harrison & Bennett report that native-born Asians are still substantially more likely to complete college (32%) than are whites and other groups, but the differential is smaller than for foreign-born Asians.

Though the relatively high education and earnings of many Asian groups mean that these groups do not suffer the same magnitude of disadvantages as many other groups, there is some evidence that returns to education are lower for Asian Americans than for whites, though this pattern may be changing (Hirschman & Wong 1984, Wong 1986). Asian men and women needed more education to receive the same income as whites. This can be attributed to discrimination in the higher end of the occupational structure (the glass ceiling effect) or to other unobservable human capital differences in things like quality of schooling or English language skills.

Hirschman & Wong (1984:584) analyzed 1960 and 1970 census data and 1976 SIE data for Japanese, Chinese, and Filipinos, as well as for other non-Asian groups. They found a marked decline in the direct negative effect of ethnicity on earnings (except among Chinese). They speculate that perhaps Chinese Americans do worse than others because the enclave of Chinatown serves as a funnel that directs Chinese Americans into low paying jobs. (This hypothesis is revisited when we review the more recent debate about the effects of ethnic enclaves on returns to education.) However, Hirschman & Wong found that there still were costs associated with Asian ethnicity—when adjusted for background variables, all groups except the Japanese had incomes somewhat less than comparable whites. Japanese men actually earned more than comparable white men in 1976. In a similar study, Wong & Hirschman (1983) found that Asian women had higher incomes overall than whites because they had higher amounts of education, lived in higher income areas, and were younger overall than whites.

In a multivariate study of income by education and by occupation, Barringer et al (1993:265) found that when other factors were controlled, "whites earned more than Asian Americans in almost all occupational categories except in the professions, where Asian Americans had much higher incomes, but even there they bested whites only among the self employed." They conclude that Asian Americans are highly educated and convert that education into high status occupations, but nevertheless they are paid less than whites for the same or comparable positions (Barringer et al 1993:266).

Recent evidence from the 1990 census shows that Asian returns to education are approaching those of non-Hispanic whites at upper levels of education. Compared to other minorities, Asians are approaching parity in their ability to convert their educational status into income and occupational standing, at 92% and 97% of comparable whites for the annual and hourly earnings of Asians with graduate degrees (Harrison & Bennett 1995). However, these analyses were not broken down by specific national origin groups.

Much of the literature on Asian Americans concerns the question of whether Asians' success makes them a "model minority" whose high education and income are due to cultural factors and hard work, which allow them to rise above adversity (Kitano 1976). The academic achievement of Asian American children, and the more stable family structure of Asian Americans, compared to other groups in America, are cited as examples of the ways their overall cultural values lead to success. Researchers critical of the success model of understanding Asian Americans stress:

1. The heterogeneity of the Asian population, the economic distress of Southeast Asian refugees, and the existence of unskilled workers employed in the low end of the split labor market (Poston 1988, 1994, Hein 1993, Lee

1989). These authors stress that there are dangers in viewing all Asians as successful, because the extreme poverty of Southeast Asians and the poverty of low skilled members of other groups will then not receive the public policy interventions that are needed.

2. The extra effort and household strategies Asian Americans are forced to use to overcome continuing discrimination, and the costs of that effort (Caplan et al 1989, Kibria 1994, Rumbaut 1989, Yamanaka & McClelland 1994, Hurh & Kwang 1989, Espenshade & Ye 1994). These researchers stress the fact that many Asians avoid extreme poverty or welfare dependence through hard work and long hours that take physical and psychic tolls on individuals and families. Also families survive by dispatching many workers into the economy and by combining wage labor, government transfers, and other creative strategies to get by.
3. The specific problems faced by Asian entrepreneurs (Min 1990). These include long hours and combining many family workers in one household, as well as facing the physical dangers of crime in shops in inner city neighborhoods, and the racial tensions, boycotts, and even riots such as those faced by Korean shop owners in black neighborhoods.

While all of these criticisms of the blind equation of Asian Americans with socioeconomic success are valid, the fact remains that many Asian Americans are doing as well, or better than, whites. Southeast Asians are not doing well overall—however, these refugees came with little formal education and little preparation for their move to the United States. The question of what will happen to their children—the second generation—is a very important one for this debate. Caplan et al (1989, 1991) cite the educational success of the children of the boat people as a hopeful sign that there will be a great deal of economic mobility. In fact they cite the educational success of children of boat people as "truly startling and extraordinary" (although their study did not include the severely distressed Cambodians and Hmong). If the children of the Southeast Asian boat people do show enormous socioeconomic mobility and high educational attainment in the future, this will indeed call forth the model minority descriptions, and it will be up to analysts to revisit the debate.

NEW IMMIGRANTS AND NATIVE MINORITIES

Perhaps the most perplexing question about the current pattern of racial and ethnic inequality in the United States is how—given the economic restructuring and loss of manufacturing jobs that have occurred—some new immigrants manage to do well in the labor force compared to native minorities? Portes & Zhou (1992:498) describe this as the "peculiar American paradox of rising labor market marginalization of native-born blacks and Puerto Ricans, along with growing numbers and employment of third world immigrants" (see also Sassen 1988). This is related to the important policy question of whether the foreign-born take jobs from native minorities. Another question that motivates research in this area is why some immigrants seem to do better than others—how to explain the relative success of Cubans or East Indians compared to Puerto Ricans or Vietnamese?

The classic economic approach to understanding the incorporation of immigrants has been to measure individual level data on human capital endowments such as education, language ability, and the like, and then assess the returns of wages and earnings to those human capital characteristics. The standard model (such as in Chiswick 1979) finds that the longer immigrants are present in the United States labor force, the more their initial earnings disadvantage is overcome. Chiswick found that the crossover point when the foreign-born equal or surpass the native-born is 15 years.

The current debate about immigrants and their human capital skills revolves around the argument of Borjas (1990, 1991) that the average skill levels or "quality" of immigrants has declined over time. This is important for understanding the assimilation process of immigrants because of the frequently used assumption that convergence between foreign-born and native-born wages and earnings equals assimilation. If it is assimilation, recent immigrants would be expected to catch up to or crossover the earlier immigrants and natives. However, if recent immigrants are of lower overall quality than earlier immigrants, then the progress seen in cross-sectional data is illusory, and more recent immigrants would be expected to have lower earnings than natives permanently.

Borjas' conclusions have been criticized on a number of points, including a failure to take into account emigration by the less successful foreign-born, (Jasso & Rosenzweig 1990) and the confusion of "immigrant quality" with national origin differences and differences in contexts of reception and modes of incorporation. As Tienda (1983b) points out, the standard human capital approach, with its emphasis on individual differences, does not explain why, after extensive controls for various determinants of earnings, there persist differences in the rate at which foreign workers of differing national origins reach income parity with the native-born population. For instance Poston (1994) in an analysis of economic attainment among foreign-born men, finds that men from European origins do much better than those from other regions of the world. He also finds that refugees-turned-immigrants from places such as El Salvador, Guatemala, Haiti, Honduras, Laos, Nicaragua, Panama, and Vietnam are not doing as well as economic immigrants from other countries in terms of their economic attainment.

Tienda (1983b) and Portes & Rumbaut (1990) argue for an analysis based on looking at the mode of incorporation or context of reception that different national origin groups face. The very evaluation of worker characteristics by employers is often not done on an individual basis but is affected by things like the degree of ethnic concentration of particular groups, and the degree of prejudice toward those groups present in American culture. The national origin differences Borjas finds in returns to human capital may be due to some unobservable individual characteristic that is a measure of "quality", or it may be due to some group level characteristics, such as the effects of ethnic networks on economic incorporation, or discrimination in the form of hiring queues, lesser pay for equal work, or some other sort of differential reaction on the part of American society based on something other than individual characteristics. Lieberson (1980) showed that greater concentrations of particular ethnic groups in a particular labor market increased the chances for competition and discrimination against those groups (see also Tienda & Wilson 1992). Later cohorts by definition face greater concentrations of their group as they join earlier migrants from their ethnic groups.

An approach that emphasizes the social as well as the economic context of the reception of immigrants includes an analysis of community level variables that condition the kinds of achievement individuals experience (Portes & Zhou 1992). An example of this approach is the discussion of the ethnic enclave as a pathway for mobility for immigrants.

The Enclave Debate

When immigrants enter a new society they often face barriers to full inclusion in the economic activities of the host society. Besides through outright discrimination, this occurs, for example, because of the absence of network ties necessary to gain access to or to succeed in certain kinds of activities, because of barriers to entry to professional or internal labor markets that have the effect of excluding those with foreign credentials, because the skills of immigrants are concentrated in specific occupations, and because these skills may not be well matched to the needs of the employers in the host society.

An immigrant group's economic standing depends in part on the way in which it overcomes these barriers to become incorporated into the economy. Often entrepreneurism has been an avenue. A consistent finding in the examination of immigrant earnings and employment is the overrepresentation of immigrants in entrepreneurial activities, and a positive relationship between self-employment and income (Portes & Zhou 1992:495). The involvement of immigrants in small business has been investigated by a number of scholars including Light (1973), Bonacich (1973), Light & Bonacich (1988), Waldinger (1986, 1989), and Waldinger et al (1990). The ethnic enclave (first defined by Wilson & Portes 1980 and Portes & Bach 1985) is a particularly important avenue of mobility for Cuban Americans. The enclave is defined as a concentration of ethnic firms in physical space—generall metropolitan area—that employ a significant proportion of workers from the same minority" (Portes & Jensen 1992:418).

Portes and his associates have argued that the enclave allows immigrants to find employment that brings better returns to their human capital than would be found in the secondary labor market outside of the enclave, and that it is therefore beneficial for workers as well as employers. They cite the Cuban enclave in Miami as an example of the use of an enclave as an unorthodox mobility path that in part explains the relative success of Cubans compared to other Hispanics. This view of the ethnic enclave has direct implications for long-held assumptions about assimilation. The argument is that people who stay within the ethnic enclave do better than those who leave it for employment, which is of course in direct contradiction to an assimilation model that would posit greater success for those leaving the ethnic concentration.

The enclave hypothesis has engendered a great deal of debate. While Portes & Jensen (1987, 1989) see the enclave as offering opportunities for economic mobility, Sanders & Nee (1987, 1992) see it as an ethnic mobility trap. These authors conducted an analysis of census data on Cubans in Miami and Chinese in California and concluded that while employers may be better off in the enclave economy, workers were not better off and may be exploited by their co-ethnic employers.

One difficulty with the debate about the impact of enclaves is that limitations of the census data that have formed the basis of many of the studies make it difficult to operationalize theoretical concepts directly. Different researchers have also used different definitions of the enclave, defining it by place of work (Portes & Jensen 1989, 1992) or place of residence (Sanders & Nee 1987, 1992). Zhou & Logan (1991) operationalized the enclave in three different ways, as place of residence, place of work, and place of industry. Using place of residence as the definition of the Chinese enclave in New York, they found positive returns for human capital for workers both inside and outside the enclave. Zhou & Logan also raise the possibility that some enclave economies provide better opportunities than others and that there may be gender differences in the operation of enclave effects.

Logan et al (1994) point out that the ethnic enclave is a relatively rare phenomenon, characterizing the Cubans in Miami, Los Angeles, and Jersey City, Mexicans in Los Angeles and Houston, Chinese in New York, San Francisco, and Los Angeles, Koreans in Los Angeles, and Japanese in Los Angeles, San Francisco, San Jose, Anaheim, and Honolulu. Many other cities have large numbers of minorities without a spatial overrepresentation of an ethnic group corresponding to an ethnic enclave. This uneven pattern of enclave development across different cities and different ethnic groups is an intriguing one, worthy of further research investigating the mechanisms by which enclaves become established.

Research about the structuring and impact of ethnic enclaves constitutes an important part of the agenda for the study of the incorporation of immigrant ethnic groups. While we do not agree with Waldinger (1993) that the term ethnic enclave should be abandoned because of the difficulty of definition and measurement, we do believe that many of the central questions about its operation are dependent not on further analyses of census data, but on gathering new data with direct measurements of theoretically relevant variables of the sort gathered by Portes & Bach (1985).

Implications of Immigration for Native Minorities

Another important set of questions about immigrants concerns their impact on native minorities. Immigrants have higher rates of entrepreneurship and labor force participation than do blacks and Puerto Ricans in the nation's cities, and lower rates of unemployment. Do immigrants take jobs from native minorities? Jackson (1983) cites the possibilities for increased interethnic tensions if immigrants succeed and leave America's longtime resident minorities behind. Some of the popular media suggested the stress caused by competition for jobs was one reason behind ethnic tensions that surfaced in the 1992 Los Angeles uprising (Muller 1993:197).

Despite these expectations, at the aggregate level, econometric studies show that immigrants do not compete with native workers and do not decrease their wages or employment levels (Borjas & Tienda 1987, Borjas 1990, LaLonde & Topel 1991). Muller (1993:181) argues that middle class blacks in gateway cities such as New York, Chicago, and Los Angeles experience upward mobility into professional and managerial sectors at rates higher than they do in cities without immigrants. However, certain industry case studies and local area studies have found substitution and competition (Waldinger 1986, Bailey 1987, Waters 1994).

Various explanations have been advanced to account for the finding that immigrants do not take jobs from native minorities. The bimodal distribution of skills among immigrants means that some immigrants arrive with high education and skills. These immigrants do not compete with those members of native minorities who are overrepresented at the lower end of the skill distribution, and they may even begin businesses that then create jobs for native workers. Simon (1989) also argued that consumption by immigrants stimulates the economy, because immigrants upon arrival begin consuming before they are employed, thus increasing demands for goods and services even if they do not find employment. However, the effect is likely negligible at best.

Waldinger's (1994) work on immigrants and natives in New York City shows that the establishment of ethnic networks and the decline in the population of native whites leads to the establishment of ethnic niches in employment and job vacancies that defuse immigrant native competition.

One important line of research studies the effect of unskilled immigrants on the employment of unskilled natives. Many reason that illegal immigrants accept lower wages and worse working conditions because of their need to work and avoid detection by immigration authorities, and because conditions of employment considered substandard in the United States exceed those available at the margin in many countries of origin.

In the economics literature, a standard approach to the study of the effect of immigrants on native workers is to treat different analyses of cities within the United States as distinct labor markets and to compare labor market outcomes across cities with higher and lower immigrant densities. Using this approach, Butcher & Card (1991) examine whether the declines in the 1980s of the real earnings of the least skilled workers in the US economy were related to immigration. They found that while the rise in wage inequality in the 1980s was bigger in cities with relatively bigger immigrant inflows, immigration was more associated with growth in wages at the high end for workers than in decline of wages at the low end.

Muller (1993) finds a negative correlation between blacks' income and the percentage of immigrants and between black youth unemployment and immigration. He concludes that either immigrants create economic growth, which in turn improves job prospects for blacks, or that Mexicans and Asians as well as blacks are all attracted to urban areas where employment opportunities are growing.

One possibility is that unskilled native workers migrate out of cities where immigrant workers are arriving. Filer (1992) analyzed population movements between 1975 and 1980 and found that intercity migration decisions of natives were sensitive to immigrant growth, and that immigrant arrivals are almost completely offset by native outflows. However, Butcher & Card (1991) find the opposite in their analysis of native migration and immigrants in the 1980s. These authors conclude that there is a positive link between immigrant inflows and net native in-migration.

Although these aggregate comparisons across cities do not show effects on unskilled native minorities of a rise in immigration, this does not mean that there are not substitution effects in particular occupations, industries, or work sites. Many black Americans believe that they are losing jobs to immigrant workers (Waters 1994). In a survey of hiring practices among Chicago area employers, Kirschenman & Neckerman (1991) found strong employer preferences in hiring decisions for immigrants over inner city blacks (see also Muller 1993:179). Substitution of immigrants for blacks in unskilled work sites might take place in ways that are difficult to measure directly. For instance large numbers of immigrants available to do contract work or working in small enterprises might affect the ability of cities and industries to hire nonunion contractors to do work previously done by unionized workers. Blacks who had been employed in unionized public work sectors could suffer as a result (Muller 1993).

These aggregate studies based on correlations between presence of immigrants and black employment and earnings in specific cities do not make clear whether blacks might have done better had immigrants not been present, and had there been economic growth. Employers may have been forced to raise wages for low skilled jobs, which might have made them more attractive to native workers.

Given the stagnation of movement toward closing the wage gap between blacks and whites, the fact that many immigrant groups do better than native populations, and the historical tendency of native labor to look warily on immigrant competition, questions about the role of immigrants on disadvantaged native minorities seem likely to generate continuing interest. One important area for research in the future is reconciling the perception by many unskilled minority workers that immigrants take jobs from them with the econometric findings that substitution is not occurring.

The Second Generation

Because new immigrants are predominantly nonwhite, the success of some new immigrants relative to native minorities leads to an intriguing question about the future of the children and grandchildren of the immigrants. Will they follow some of the more hopeful patterns of success and mobility that seem to characterize their parents? Or will they experience downward social mobility as they join America's native nonwhite minority in disproportionate poverty, low skilled work, and unemployment? While there have been no wide-scale studies of the second generation of the post-1965 immigrants, recent years have produced a number of case studies and a few thoughtful and important hypotheses about the experiences of the second generation.

Gans (1990) suggests that in contrast to the children of European immigrants early in this century, the second generation of post-1965 immigrants may well experience socioeconomic decline relative to their parents because of the much changed opportunity structure in the American economy. He outlines several scenarios of possible socioeconomic and social integration of this new second generation. He hypothesizes that some of the children of the immigrants might "Americanize" by adopting the negative attitudes of many American youths toward the low-level, low-pay jobs to which they, like their parents, appear to be confined. On the other hand, some may remain tied to their parents' ethnic community and values; by rejecting the negative attitudes toward school, opportunity, hard work, and the "American dream" that some among the native poor have adopted, these children may end up doing better. If this is true, the ironic result may well find "the people who have secured an economically viable ethnic niche acculturating less than did the European 2nd and 3rd generations" (Gans 1990:188), and those without such a niche may become American but experience downward social mobility and reclassification as "undeserving members of the so-called underclass" (Gans 1990:183).

Portes & Zhou (1993) make a similar argument. They argue that the mode of incorporation of the first generation creates differential opportunities and cultural and social capital in the form of ethnic jobs, networks, and values that create differential pulls on the allegiances of the second generation.

For immigrant groups who face extreme discrimination in the United States and who are close in proximity to American minorities who have faced a great deal of discrimination, "reactive ethnicity" emerges in the first generation. For groups who come with strong ethnic networks, access to capital, and with fewer ties to minorities in the United States, "linear ethnicity" develops. Groups with linear ethnicity may resist acculturation in the United States and end up providing better opportunities for the second generation through the "social capital" created through ethnic ties. The second generation of those with reactive ethnicity, by contrast, are likely to develop the "adversarial stance" toward the dominant white society that American minorities such as poor blacks and Hispanics hold. They conclude: "Children of nonwhite immigrants may not even have the opportunity of gaining access to middle class white society, no matter how acculturated they become. Joining those native circles to which they do have access may prove a ticket to permanent subordination and disadvantage" (Portes & Zhou 1993:96). These hypotheses rest on notions of network ties, community resources, and social capital that require in-depth study among both native minority groups and the second generation. Because the census no longer asks a question about birthplace of parents (last asked in the 1970 census) the second generation disappears statistically into the native minority population. This is a serious problem in assessing overall trends of assimilation and success for the post-1965 immigrant cohort, as well as in measuring negative or positive impacts of immigrants on native-born minorities. Determining which of the scenarios outlined by these analysts actually will occur will be dependent on careful ethnographic research in these communities, on gathering detailed and expensive survey data, and on reinstituting the census question on parental birthplace.

CONCLUSION

The research literature on ethnic inequality reviewed here shows that progress in narrowing the gap between minorities and whites and among white ethnics was made when the economy was expanding through the mid-1970s. After that, for many groups, the progress slowed, stopped, or reversed. The restructuring of the American economy in the last few decades has hit many unskilled minority workers hard. In addition, the evidence indicates that direct discrimination is still an important factor for all minority subgroups except very highly educated Asians. The large numbers of immigrants entering the United States in recent decades have had mixed success, but there are some intriguing ways in which immigrants seem to have achieved mobility in spite of hard economic times and nonwhite status.

In addition to the questions and data needs described in the above discussions of the second generation and of the ethnic enclave, we see some additional important avenues for further research. These include the unraveling of the separate and interactive effects of gender and race/ethnicity, an analysis of the involvement of immigrants in affirmative action programs, and the effects any such involvement may have on native minorities. In addition a sustained look is needed at the question of what continues to cause direct labor market discrimination by employers in favor of whites and immigrants over blacks in hiring decisions.

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Literature Cited

Abowd JM, Killingsworth MR. 1985. Employment, wages, and earnings of Hispanics in the Federal and non-Federal sectors: methodological issues and their empirical consequences. See Borjas & Tienda 1985, pp. 77–126

Alba R. 1990. *Ethnic Identity: The Transformation of White America.* New Haven: Yale Univ. Press

Bailey T. 1987. *Immigrants and Native Workers: Contrasts and Competition.* Boulder: Westview

Bane MJ. 1986. Household composition and poverty. In *Fighting Poverty: What Works and What Doesn't,* ed. SH Danziger, DH Weinberg, pp. 209–31. Cambridge: Harvard Univ. Press

Barringer H, Gardner RW, Levin MJ. 1993. *Asians and Pacific Islanders in the United States.* New York: Russell Sage Found.

Bean FD, Tienda M. 1987. *The Hispanic Population of the United States.* New York: Russell Sage Found.

Bonacich E. 1973. A theory of middlemen minorities. *Am. Sociol. Rev.* 37:547–59

Borjas GJ. 1990. *Friends or Strangers: The Impact of Immigrants on the U.S. Economy.* New York: Basic

Borjas GJ. 1991. Immigrants in the U.S. labor market 1940–1980. *AEA Pap. Proc.* 81(2): 287–91

Borjas GJ, Tienda M, ed. 1985. *Hispanics in the U.S. Economy.* Orlando: Academic

Borjas GJ, Tienda M. 1987. The economic consequences of immigration. *Science* 235:645–52

Borjas GJ, Tienda M. 1993. The employment and wages of legalized immigrants. *Int. Migration Rev.* 27(4):712–47

Brooks-Gunn J, Duncan G, Klebanov PK, Sealand N. 1993. Do neighborhoods influence child and adolescent development? *Am. J. Sociol.* 99:353–96

Bureau of the Census. 1993. *Census of Population. 1990. Social and Economic Characteristics CP-2-1.* US Dep. Commerce. Washington, DC: USGPO

Butcher KF, Card D. 1991. Immigration and wages: evidence from the 1980's. *AEA Pap. Proc.* 81(2):292–96

Caplan N, Choy MH, Whitmore JK. 1991. *Children of the Boat People: A Study of Educational Success.* Ann Arbor: Univ. Mich. Press

Caplan N, Whitmore JK, Choy MH. 1989. *The Boat People and Achievement in America: A Study of Family Life, Hard Work, and Cultural Values.* Ann Arbor: Univ. Mich. Press

Carnoy M, Daley HM, Ojeda RH. 1993. The changing position of Latinos in the US labor market since 1939. See Morales & Bonilla 1993, pp. 28–54

Chiswick B. 1979. The economic progress of immigrants: some apparently universal patterns. In *Contemporary Economic Problems,* ed. W Fellner, pp. 357–99. Washington, DC: Am. Enterprise Inst.

Cornell SE, Kalt JP. 1990. Pathways from poverty: economic development and institution building on American Indian reservations. *Am. Indian Cult. Res. J.* 14:89–125

Crane J. 1991. Effects of neighborhoods on dropping out of school and teenage childbearing. In *The Urban Underclass,* ed. C Jencks, PE Peterson, pp. 299–320. Washington, DC: Brookings Inst.

Danziger S, Gottschalk P, eds. 1993. *Uneven Tides: Rising Inequality in America.* New York: Russell Sage Found.

Davis FJ. 1991. *Who Is Black? One Nation's Definition.* University Park, PA: Penn. State Univ. Press

DeFrietas G. 1985. Ethnic differentials in unemployment among Hispanic Americans. See Borjas & Tienda 1985, pp. 127–60

DeFrietas G. 1991. *Inequality at Work: Hispanics in the U.S. Labor Force.* New York: Oxford Univ. Press

Eschbach K. 1995. The enduring and vanishing American Indian: American Indian population growth and intermarriage in 1990. *Ethnic Racial Stud.* 18:89–108

Espenshade TJ, Ye W. 1994. Differential fertility within an ethnic minority: the effect of trying harder among Chinese American women. *Social Prob.* 41(1):97–113

Farley R. 1993. The common destiny of blacks and whites. In *Race in America: The Struggle for Equality,* ed. H Hill, JE Jones, pp. 197–233. Madison: Univ. Wisc.

Farley R, Allen WR. 1987. *The Color Line and the Quality of Life in America.* New York: Russell Sage Found.

Feagin JR, Sikes MP. 1994. *Living with Racism: The Black Middle-Class Experience.* Boston: Beacon Press.

Filer RK. 1990. The impact of immigrant arrivals in migratory patterns of native workers. In *Immigration and the Work Force: Economic Consequences for the United States and Source Areas,* ed. G Borjas, R Freeman, pp. 245–69. Chicago: Univ. Chicago Press

Gans HJ. 1979. Symbolic ethnicity: the future of ethnic groups and cultures in America. *Ethnic Racial Stud.* 2:1–20

Gans HJ. 1990. Second generation decline: scenarios for the future economic and ethnic futures of the post-1965 American immigrants. *Ethnic Racial Stud.* 15:173–92

Greeley AM. 1974. *Ethnicity in the United States.* New York: Wiley

Gwartney JD, Long JE. 1978. The relative earnings of blacks and other minorities. *Indust. Lab. Relat. Rev.* 31:336–46

Harrison RJ, Bennett C. 1995. Racial and ethnic diversity. In *State of the Union: American in the 1990s,* Vol. 2. *Social Trends.* ed. R Farley, pp. 141–210. New York: Russell Sage Found.

Harrison B, Bluestone B. 1988. *The Great U-Turn: Corporate Restructuring and the Polarization of America.* New York: Basic

Hein J. 1993. Refugees, immigrants and the state. *Annu. Rev. Sociol.* 19:43–59

Hirschman C. 1983. The melting pot reconsidered. *Annu. Rev. Sociol.* 9:397–423

Hirschman C, Wong MG. 1984. Socioeconomic gains of Asian Americans, blacks and Hispanics: 1960–1976. *Am. J. Sociol.* 90:584–607

Hout M, Goldstein J. 1994. How 4.5 million Irish immigrants became 40 million Irish Americans: demographic and subjective aspects of the ethnic composition of white Americans. *Am. Sociol. Rev.* 59:64–83

Hurh WM, Kim KC. 1989. The success image of Asian Americans: its validity, and its practical and theoretical implications. *Ethnic Racial Stud.* 12(4):512–37

Jackson K. 1983. The old minorities and the new immigrants: understanding a new cultural idiom in U.S. history. See MM Kritz 1983, pp. 317–35

Jasso G, Rosenzweig MR. 1990. Self selection and the earnings of immigrants: comment. *Am. Econ. Rev.* 80(1):298–304

Jaynes GD, Williams RM, eds. 1989. *A Common Destiny: Blacks and American Society.* Washington, DC: Natl. Acad. Press

Jencks C. 1991. Is the American underclass growing? In *The Urban Underclass,* ed. C Jencks, PE Peterson, pp. 28–100. Washington, DC: Brookings Inst.

Jencks C. 1992. *Rethinking Social Policy: Race, Poverty, and the Underclass.* Cambridge: Harvard Univ. Press

Jencks C, Mayer SE. 1990. The social consequences of growing up in a poor neighborhood. In *Inner City Poverty in the United States,* ed. LE Lynn, MGH McGeary, pp. 111–86 Washington, DC: Natl. Acad. Press.

Kalmijn M. 1993. Trends in black/white intermarriage. *Soc. Forces* 72:119–46

Kasarda J. 1985. Urban change and minority opportunities. In *The New Urban Reality,* ed.

PE Peterson, pp. 33–68. Washington, DC: Brookings Inst.

Kenney GM, Wissoker DA. 1994. An analysis of the correlates of discrimination facing young Hispanic job seekers. *Am. Econ. Rev.* 84(3):674–83

Kibria N. 1994. Household structure and family ideologies: the dynamics of immigrant economic adaptation among Vietnamese refugees. *Social Prob.* 41(1):301–15

Kirschenman J, Neckerman KM. 1991. "We'd love to hire them, but...": the meaning of race for employers. In *The Urban Underclass*, ed. C Jencks, PE Peterson, pp. 28–100. Washington, DC: Brookings Inst.

Kitano H. 1976. *Japanese Americans: The Evolution of a Subculture*. Englewood Cliffs, NJ: Prentice Hall

Kritz MM, ed. 1983. *U.S. Immigration and Refugee Policy: Global and Domestic Issues*. Lexington, Mass: Lexington

LaLonde R, Topel RH. 1991. Immigrants in the American labor market: quality assimilation and distributional effects. *AEA Pap. Proc.* 81(2):297–302

Lee SM. 1989. Asian immigration and American race relations: from exclusion to acceptance? *Ethnic Racial Stud.* 12(3):368–91

Lieberson S. 1980. *A Piece of the Pie: Blacks and White Immigrants Since 1880*. Berkeley, CA: Univ. Calif. Press

Lieberson S, Waters MC. 1988. *From Many Strands: Ethnic and Racial Groups in Contemporary America*. New York: Russell Sage Found.

Light I. 1973. *Ethnic Enterprise in America: Business and Welfare among Chinese, Japanese and Blacks*. Berkeley, CA: Univ. Calif. Press

Light I, Bonacich E. 1988. *Immigrant Entrepeneurs: Koreans in Los Angeles, 1965–1982*. Berkeley: Univ. Calif. Press

Logan JR, Alba R, McNulty T. 1994. Ethnic economies in metropolitan regions: Miami and beyond. *Soc. Forces* 72(3):691–724

Mare RD, Winship C. 1984. The paradox of lessening racial inequality and joblessness among black youth: enrollment, enlistment and employment, 1964–1981. *Am. Sociol. Rev.* 49(1):39–55

Min PG. 1990. Problems of Korean immigrant entrepreneurs. *Int. Migration Rev.* 24(3): 436–55

Morales R, Bonilla F, ed. 1993. *Latinos in a Changing U.S. Economy*. Newbury Park, CA: Sage

Moss P, Tilly C. 1991. *Why Black Men are Doing Worse in the Labor Market: A Review of Supply-Side and Demand-Side Explanations*. New York: Soc. Sci. Res. Coun.

Muller T. 1993. *Immigrants and the American City*. New York: New York Univ. Press

Myrdal G. 1944. *An American Dilemma: The Negro Problem and Modern Democracy*. New York: Harper Bros.

Nelson C, Tienda M. 1985. The structuring of Hispanic ethnicity: historical and contemporary perspectives. *Ethnic Racial Stud.* 8:49–74

Portes A, Bach RL. 1985. *Latin Journey: Cuban and Mexican Immigrants in the United States*. Berkeley, CA: Univ. Calif. Press

Portes A, Jensen L. 1987. What's an ethnic enclave? The case for conceptual clarity. *Am. Sociol. Rev.* 52:768–71

Portes A, Jensen L. 1989. The enclave and the entrants: patterns of ethnic enterprise in Miami before and after Mariel. *Am. Sociol. Rev.* 54:929–49

Portes A, Jensen L. 1992. Reply to Sanders and Nee: disproving the enclave hypothesis. *Am. Sociol. Rev.* 57:418–20

Portes A, Rumbaut RG. 1990. *Immigrant America: A Portrait*. Berkeley, CA: Univ. Calif. Press

Portes A, Truelove C. 1987. Making sense of diversity: recent research on Hispanic minorities in the United States. *Annu. Rev. Sociol.* 13:359–85

Portes A, Zhou M. 1992. Gaining the upper hand: economic mobility among immigrant and domestic minorities. *Ethnic Racial Stud.* 15(4):491–521

Portes A, Zhou M. 1993. The new second generation: segmented assimilation and its variants. *Annals, AAPSS* 530:74–96

Poston DL. 1988. The socioeconomic attainment patterns of Asian Americans. *J. Sociol.* 19:213–34

Poston DL. 1994. Patterns of economic attainment of foreign born male workers in the U.S. *Int. Migration Rev.* 28(3):478–500

Reimers CW. 1985. A comparative analysis of the wages of Hispanics, blacks, and non-Hispanic whites. See GJ Borjas, M Tienda, pp. 27–76

Rumbaut R. 1989. Portraits, patterns and predictors of the refugee adaptation process. In *Refugees as Immigrants: Cambodians, Laotians and Vietnamese in America*, ed. D Haines, pp. 138–82. Totowa, NJ: Rowman & Littlefield

Sanders JM, Nee V. 1987. Limits of ethnic solidarity in the enclave economy. *Am. Sociol. Rev.* 52:745–67

Sanders JM, Nee V. 1992. Comment on Portes and Jensen: problems in resolving the enclave economy debate. *Am. Sociol. Rev.* 57: 415–18

Sandefur GD, Scott WJ. 1983. Minority group status and the wages of Indian and black males. *Soc. Sci. Res.* 15:347–71

Sassen S. 1988. *The Mobility of Labor and Capital: A Study in International Investment and Labor Flow*. New York: Cambridge Univ. Press

Simon J. 1989. *The Economic Consequences of Immigration.* Oxford: Basil Blackwell

Smith JP, Welch FR. 1989. Black economic progress after Myrdal. *J. Econ. Lit.* 28:519–64

Snipp CM. 1986. The changing political and economic status of American Indians: from captive nations to internal colonies. *Am. J. Econ. Sociol.* 45:145–58

Snipp CM. 1989. *American Indians: The First of This Land.* New York: Russell Sage Found.

Snipp CM, Sandefur GD. 1988. Earnings of American Indians and Alaska Natives: the effects of residence and migration. *Soc. Forces* 66:994–1008

Stolzenberg RM. 1990. Ethnicity, geography and occupational achievement of Hispanic men in the U.S. *Am. Sociol. Rev.* 55:143–54

Tienda M. 1983a. Nationality and income attainment among native and immigrant Hispanic men in the United States. *Sociol. Q.* 24:253–72

Tienda M. 1983b. Socioeconomic and labor force characteristics of U. S. immigrants: issues and approaches. See M Kritz 1983, pp. 211–31

Tienda M, Donato KM, Cordero-Guzman H. 1992. Schooling, color and the labor force activity of women. *Soc. Forces* 71(2):365–95

Tienda M, Wilson FD. 1992. Migration and the earnings of Hispanic men. *Am. Sociol. Rev.* 57:661–78

Trosper RL. 1974. *The economic impact of the allotment policy on the Flathead Reservation.* PhD thesis. Harvard Univ. Cambridge, Mass.

Trosper RL. 1994. Who is subsidizing whom? In *American Indian Policy: Self-Governance and Economic Development,* ed. LH Legters, FJ Lyden, pp. 175–90. Westport, CT: Greenwood

Waldinger R. 1986. *Through the Eye of the Needle: Immigrants and Enterprise in New York's Garment Trades.* New York: New York Univ. Press

Waldinger R. 1989. Structural opportunity or ethnic advantage? Immigrant business development in New York. *Int. Migration Rev.* 23(1):48–72

Waldinger R. 1993. The ethnic enclave debate revisited. *Int. J. Urban Regional Res.* 17: 444–53

Waldinger R. 1994. The making of an immigrant niche. *Int. Migration Rev.* 28(1):3–30

Waldinger R, Aldrich H, Ward R, et al. 1990. *Ethnic Entrepeneurs: Immigrant Business in Industrial Societies.* Newbury Park, NJ: Sage

Warner WL, Srole L. 1945. *The Social Systems of American Ethnic Groups.* New Haven, CT: Yale Univ. Press

Waters MC. 1994. *West Indian immigrants, African Americans and Whites in the workplace.* Presented at Annu. Meet. Am. Sociol. Assoc., Los Angeles

White R. 1983. *The Roots of Dependency: Subsistence, Environment and Social Change Among the Choctaws, Pawnees, and Navajos* Lincoln, NB: Univ. Nebr.

Wilson KL, Portes A. 1980. Immigrant enclaves: an analysis of the labor market experiences of Cubans in Miami. *Am. J. Sociol.* 86:295–319

Wilson WJ 1987 *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy.* Chicago: Univ. Chicago Press

Wong MG. 1986. Post-1965 Asian immigrants: where do they come from, where are they now, and where are they going? *Ann. Am. Acad Pol. Soc. Sci.* 487:150–68

Wong MG, Hirschman C. 1983. The new Asian immigrants. In *Culture, Ethnicity and Identity: Current Issues in Research,* ed. W McCready, pp. 381–403. New York: Academic

Yamanaka K, McClelland K. 1994. Earning the model minority image: diverse strategies of economic adaptation by Asian American women. *Ethnic Racial Stud.* 17(1):79–113

Zhou M, Logan J. 1991. Returns on human capital in ethnic enclaves: New York City's Chinatown. *Am. Sociol. Rev.* 54:809–20

Judith Blake

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A BIOGRAPHICAL ESSAY ON JUDITH BLAKE'S PROFESSIONAL CAREER AND SCHOLARSHIP

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KEY WORDS: social demography, population policy, family size, fertility, women sociologists, pronatalist policies

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ABSTRACT

Judith Blake was born and raised primarily in New York City; she received her BS degree magna cum laude from Columbia University in 1951 and her PhD in 1961. She had a remarkable and sustained record of scholarly contributions, which can be divided into five interrelated periods differentiated by a combination of substantive emphases, methodological appraoches, and time periods. Blake was the founding Chair of the Group in Demography at the University of California, Berkeley, which became the first demography department in the United States. She subsequently was the first incumbent of the Fred N. Bixby Chair in Population Policy at the School of Public Health at the University of California, Los Angeles, with a joint appointment in sociology. Blake served on numerous university and professional committees and boards and was elected President of the Population Association of America in 1981, the association's fiftieth anniversary. At the time of her death (1993), Blake was Editor of the *Annual Review of Sociology*. Judith Blake was a dynamic and creative researcher and teacher who left a strong legacy in her research, the students she taught, and the friends and colleagues she influenced.

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INTRODUCTION

Wide-ranging intellectual rigor combined with passion, enthusiasm, and a concern with major contemporary problems characterized Judith Blake. It permeated her research, her teaching, her professional activities, and her interactions with colleagues. On May 4, 1989, Jean van der Tak interviewed Judith as a part of a series of interviews with past Presidents and Secretary-Treasurers of the Population Association of America. Jean observed that Judith's philosophy for research and writing craves "theoretical relevance and simplicity of conceptual framework.... [which] responds to lucid presentation of investigative problems"; Judith says it best:

> I've always been interested in what I felt to be major problems and not really that interested in just descriptive stuff.... I ... wanted to deal with what I felt were some critical problems in the field .... And ... I wanted to present them clearly if I could, and in an interesting and very lively way, so that people would have access to them.
>
> Also I always had as a goal that people should ... have as much enthusiasm about population as a field as I did. So I wanted to almost shake them and say, "You've got to realize that this can be very interesting and exciting and you should realize this deals with ... big problems, not just little mathematical sums or something. I want you to see that this is something that can be interesting and that you can get steamed up about." ... I would ... try to reach out and grab people and have them suddenly realize, "This is a very interesting thing." And when you read it, you say, "Gee, I didn't realize this, ... I suddenly see this a little differently from the way I did, and it's not that dull after all." (Demographic Destinies, 1991, p. 507)

Judith was never dull. The questions she asked were timely and controversial. The research she conducted was impeccable. The context within which she conducted her research and formulated her research questions was wide-ranging and as likely to draw on history and social anthropology as sociology, math, and economics. And her writing style was pertinent, lively, and accessible. But how and why did she get that way? Where did she get her enthusiasm and her seeming fearlessness in challenging established wisdom? We may never have a complete answer to that question, but after examining her research articles, the interview conducted by Jean van der Tak, the comments of her family, her colleagues, and her friends, I believe that Judith's unique ability both to see the "big picture" and to challenge current interpretations evolved—at least in part—from the unique circumstances of her childhood, the selection, timing, and location of her graduate work, and her experiences as a young wife and mother during a period when women were not readily welcomed into the ivy towers of academia. Rather than taking this as an excuse for failure or complaint, Judith viewed adversity as a challenge. When Judith came to a barrier in her personal life or her intellectual career, she confronted it head-on, examined it from all conceivable angles, and sailed around it, over it, under it or through it, often redefining it in the process, not only for herself but for others. Judith was a master at breaking psychological set—that tendency that we all have to confront recurring situations with the same old bag of partially successful, but tired, solutions, rather than to consider new approaches that might ultimately be more successful.

In reviewing Judith's career I start with a brief biography of her life and then examine her research. Wherever possible I depend on Judith's own words and those of her colleagues and friends in describing who she was and what she thought.

CHILDHOOD AND EDUCATION

Judith was born and raised primarily in New York City; she received her BS degree magna cum laude from Columbia University in 1951 and her PhD in 1961. But as her sister Valerie Oppenheimer points out, during Judith's childhood, it was hardly self-evident that she would go to college, let alone become a leading figure in American demography.

> [Judith] came from a family background that was not at all conducive to major academic achievements. In the Great Depression, our father's firm was sort of smallish, and it was ruined, thereby dealing a mortal blow to an already shaky marriage, and while I was still an infant [having been born in England], my mother went back home with us to New York City, where we all crammed into our grandmother's small apartment. Our father remained in California, and neither of us saw him again till we were adults. Hence Judith and I grew up in a three-generation, all-female household, with our mother, grandmother, and maiden aunt, in a state that used to be called "genteel poverty." The adults in our family were all traditional middle-class women with quite modest educational attainments, although reared in a tradition that fostered an appreciation of literature, music, and the arts. None of them evidenced any intellectual leanings that I ever noticed. They believed that ideally young women should marry and be properly supported by their husbands. In fact, I always suspected that in their eyes, the main function of a man in this world was to support a wife in the style to which she aspired.
>
> So how did such a family spawn two professionals? Well, among other things, events led to the recognition that for a variety of reasons, women might find themselves without male support. Here was a group of women, who through widowhood, divorce, and spinsterhood, had to support themselves but were ill-prepared to do so given their background. Hence, it was borne in on everyone that being able to paddle your own canoe, even if only temporarily, would have a decided advantage. However, I don't think any of the adults quite knew how to achieve this.
>
> Consistent with her background, my aunt's approach to the problem was that Judith should have a career as an actress and model, supervised by her aunt, of course. And therefore, Judith was dragged around to one producer's office or another for years, depriving her of a normal adolescence. Although she eventually escaped from this grind, the advantages of some kind of career were brought home

> to us. Since she was also very bright, Judith rapidly saw the role of education in accomplishing this. This led to going to Columbia University, where she eventually landed in sociology and then social demography.
>
> However, considering our background, the transformation of a budding ingenue to a professor in social demography was nothing short of a miracle. Judith's pioneering trail and the immediacy of it provided by close association were extremely important in my own academic journey. Judith was the only one in the family that quite seemed to have a head on her shoulders, and always had quite definite career goals—albeit frequently changing ones, but whichever they were at the time, they were definite—that she was working very hard to achieve. She provided me with a constant cafeteria of options to sample. Hence, I aspired to read everything she said was good, and at least thought of trying out every possible career she was considering. The results were not always satisfactory, to be sure; I read many of the literary classics before I was old enough to understand them, because she was my big sister. But that was all right, it led me to discover the section of the local library on science. [When] I ran out of the Thomas Hardy, I got [to the science section]. I positively loathed acting, acting and the whole theater and TV scene; I hated modeling with a passion; and early on realized that a literary career was not for me. Finally, Judith hit the jackpot, from my perspective, at least. She became involved with social demography, a field which I, along with most people in those days, had never even heard of. She naturally recommended I look into it, she always recommended I look into everything she did, especially since demography, early on, provided good career options for women. There were already several eminent women demographers. This was not an unimportant consideration in those days .... Meanwhile, I was just finishing up a bachelor's in anthropology, but getting, I must say, dreadfully tired of the constant menu of village life it offered up. Gradually there had been building up in me a burning desire to be able to say something about a society or country as a whole, and to go beyond the rubric of culture. Judith's encouragement to explore demography, plus Kingsley Davis's book on the population of India and Pakistan, opened up an entirely new intellectual world to me. It is one I've been happily exploring ever since. So, coming from a family background where the sciences, social or natural, were part of the great unknown, Judith managed to carve herself a highly distinguished career, and by her pioneering efforts, also showed me the way to a field with intellectual rewards I treasure today. (Valerie Oppenheimer, *Memorial Service for Judith Blake,* 1993)

Judith's own description of how and why she selected social demography confirms, complements, and expands Valerie's observations.

> I guess I was really looking for a sub-field of sociology that was empirical and very broad in its disciplinary scope, international, and that would have an influence on world affairs. I wasn't interested in voting and political participation, for example, which was the focus of most survey research at Columbia. This was Paul Lazarsfeld's focus, really his main interest. Although I was interested in the survey side, I wasn't interested in the voting side. And I wasn't a Marxist. There was a very strong, very distinguished, Marxist tradition at Columbia, with Robert Lynd and Herbert Marcuse and all of that. So that was a whole contingent that was kind of ruled out for me.
>
> So for a while, I was really at sea. Then, strangely enough, I was walking along

Amsterdam Avenue one day and met Alice Taylor, who became Alice Taylor Day, ultimately, but was then just plain Alice Taylor, and told her, "Alice, I'm just not quite focusing in this place and I don't know what to do." Alice was always a dear, sweet person and she said, "Oh, that's no problem; you ought to take a course in demography. I know you're going to be crazy about it; it's just for you." [Judith went straight to graduate school at Columbia after finishing her undergraduate degree.] I was a New Yorker and I really didn't know there was anyplace else; it never occurred to me to go elsewhere. Also I didn't have much money. And it wasn't so dumb, because I knew the territory there, and for me to have uprooted myself to go someplace else without any financial backing or anything would have been a little foolhardy. So I stayed.

One of the things that had happened was I was sort of burned out, because I had taken all these graduate courses for undergraduate credit and by the time I was a graduate student, there really wasn't much else to take. And I had kind of worked my way through a series of enthusiasms which I then worked my way out of, and I was just beginning to feel, "What am I doing here?"

Alice said, "The course is just starting up." So I registered. The course was being taught by Hope Eldridge, who was a wonderful person ....

I've asked myself this over time: What was it that just knocked me for a loop? I think partly it was there were so many data. Now this may not sound important to you, but at the time, generating information was not easy. Sociology had just survived the throes—and was really in the throes—of community studies, studies that were mainly asking how many social classes could you find in a community, and some people found six and some found eight and some found twelve. But fundamentally, generating data, information about whether things were true or not true and whatever, wasn't easy. It was really a tough proposition to process those data as well.

So here was a field where you were awash in data; the stuff was just pouring out. That was wonderful. In the course, you were set to work on lab problems where you were actually looking at census data and manipulating them and there they were for any country you could think of. It was just terrific! Also, you could do comparative analyses and I liked that. I liked the idea of looking at a lot of different countries and comparing.

And surveys also seemed to me to be very applicable. As I started thinking about demographic issues, I got beyond the data side very rapidly and started thinking about why things were happening. I started to realize that the training I'd had in surveys should be very applicable, because what people were asking were analytical questions and with censuses it was hard to zero in on those. By and large, censuses were legal documents and you were very limited as to what you could ask, and vital registration data were the same. So I moved rapidly in my own mind from thinking, "This is a field where you're awash in data," to thinking, "This is a field where you're awash in data, but none of them are quite right for what you're asking, what you're interested in." They were suggestive and you would do these analyses, and then you would be left with kind of an empty pot, because the real questions you wanted to ask you didn't have any control over.

So at the time, I thought that doing surveys was a way of amalgamating training I had had with what I conceived to be the new demography. And I got really enthusiastic about that. So I stayed in the course for the semester and was making very rapid strides and thinking about what I would be interested in doing. Then

> Kingsley came back from Africa and gave the second half of the course. He was full of all of the international comparative stuff and what had been going on in Africa. That just blew me away, I mean the fact that you would be going to the Dark continent and seeing all these things; it was a period of enormous change and colonial problems and so forth.
>
> I got a job at the Bureau for Applied Social Research, which was run by Lazarsfeld and Kingsley and Robert Merton and that crowd. I got a job on the cities' project, which was being done for the Air Force. This project was looking at census data on cities, aggregate data. It didn't take me long to realize that I didn't like dealing solely with very aggregated data. Then I thought, "Oh dear, what am I doing in demography, because demography is mainly aggregated data?" and I was beginning to worry again that perhaps I was in the wrong spot.
>
> Then this Jamaica project came along. The Conservation Foundation funded it and they were interested in the birth rate and family structure and so forth in Jamaica. I just flipped out; I thought this was a terrific idea. Actually, it ended up being the third survey of the topic in a developing country. The first had been Paul Hatt's in Puerto Rico and the second was the one Joe Stycos was doing in Puerto Rico; Joe Stycos had worked with Hatt. Joe was going to be the project leader and I was going to be his sidekick and we were going to go down and do this project in Jamaica. You have to realize we weren't very old; maybe Joe was 27 and I was 26, something like that. (*Demographic Destinies,* 1991, pp. 499–500)

Judith's reminiscences about her graduate education and her introduction to demography set the stage for many of the themes that later would be developed in her research and teaching. Before selecting demography as an area of concentration, Judith already had completed most of the available coursework in the department, which included exposure to some of the major sociological theorists and methodologists of the period. The study on cities, referenced above, resulted in Judith's first publication, a monograph for the Air Force (Foley et al 1953). The Jamaican study formed the basis of her dissertation, which resulted in the sole-authored book *Family Structure in Jamaica: The Social Context of Reproduction* (1961). One of a series of classic studies conducted by demographers during the 1950s, Judith's Jamaican research was one of the first to emphasize the social structural context in which fertility occurs—but let Judith describe it in her own words:

> We went ... to Jamaica and found ... a not overly hospitable environment, which was mainly dominated by anthropologists, who felt that doing a survey in Jamaica was about as loony as you could get .... We didn't pay too much attention to this. Joe is an incredible field person .... And we had the 1953 census we could use as a sampling frame .... So we went out and got ourselves a sample and did all the right things. We had our schedule ready and we went to the Census Bureau and other agencies to get trained interviewers, whom Joe trained some more, with great skill, and went into the field and did the survey.
>
> Those surveys—the Hatt, the Stycos and Hill and Back, and the Jamaican studies—I think really laid the groundwork for people no longer thinking it was loony to do surveys in these countries .... which were much less interested in the causes of fertility behavior, which was our focus, and much more sort of descrip-

> tive knowledge—attitudes and practice (of birth control) types of instruments. [We looked at socioeconomic background], family structure background and incentives and disincentives—what we considered the big questions ... (*Demographic Destinies*, 1991, p. 500)

RESEARCH CAREER

Judith Blake had a remarkable and sustained record of scholarly contributions, which can be divided into five interrelated periods differentiated by a combination of substantive emphases, methodological approaches, and time periods. Her early career was characterized by research that was heavily theoretical in orientation, with most of the articles addressing major policy issues and the future of social demography. Much of her research adopted a historical perspective and, with the exception of the Jamaican study, did not involve data collection or analysis. When data were collected and analyzed, the methodology used combined social anthropology with survey research techniques. The methodology of Judith's later research combined secondary analysis of existent data sets and data obtained from questions commissioned by Judith as part of ongoing national surveys such as the Gallup Poll. It was in the design and implementation of these later studies that Judith hit her stride as a social demographer who was frequently ahead of her time and who rarely accepted popular or conveniently available explanations of population trends and processes.

Early Research, 1951–1964

The Jamaican study (Stycos & Blake 1954, Blake 1955, Blake 1961) had as one of its goals explaining why Jamaica's birth rate was lower than Puerto Rico's (40 vs. 33) given the greater availability of family planning clinics in Puerto Rico. Data were collected through 100 detailed and highly qualitative interviews with females and about 50 interviews with males selected to represent lower income families. The primary objective was to add to a growing body of scientific knowledge concerning institutional factors and concomitant attitudes relating to fertility in different cultures.... It is therefore in the study of family relationships and the attitudes which arise in and lend support to these relationships that one must begin (Stycos & Blake 1954, p. 349). Judith and her colleagues found that:

> This emphasis on biological paternity, a recurrent theme in the spontaneous replies of our respondents, was not anticipated by the investigators .... We assumed instead that the pater (the sociological father) would be emphasized as it is in many cultures where plural mating and/or matrilineal descent are the norm. In addition, we did not expect that the motivation of the woman would be so explicitly centered on meeting the desires of the man, that the male's desires would be so dominant. (Blake 1955, p. 32)

Judith's important research contributions predated the completion of the Jamaican study, which also served as her dissertation. In 1956, she wrote (with Kingsley Davis) "Social Structure and Fertility: An Analytic Framework," which provided a framework within which much of the social demographic research on fertility continues to this day:

> The present paper represents an attempt to set forth and utilize an analytical framework for the comparative sociology of fertility. It first presents a classification of the intermediate variables through which any social factors influencing the level of fertility must operate. It next tries to show, in broad outline, how some types and elements of social organization, acting through these variables, appear to enhance or depress societal fertility. Our hope is that as more sociological and demographic information becomes available, the theories advanced can be refined further and tested empirically. (Davis & Blake 1956, p. 211)

The paper was originally presented in a session on "Foreign Studies" at the 1955 Annual Meeting of the Population Association of America (PAA). This was only the second PAA meeting that Judith attended. When asked by Jean van der Tak how people reacted at the time, Judith said:

> There was a big reaction all right. Some of it was very controversial ... But when the paper finally came out, it caught on very rapidly, because it solved a very basic problem of how to look at things .... (*Demographic Destinies*, 1991, p. 513)

Although Judith appreciated the impact that this classic paper had on social demography, she was not sure by 1989 that the original ideas were being applied in the ways intended by the authors. Judith was particularly concerned with the way in which the analytical framework had been applied to the World Fertility Surveys (WFS).

> The whole point of the article was to say, "If you want to look at sociocultural influences on fertility, then you have to be aware of what they operate through and that these are the variables they operate through." ... [N]obody would ... have accused us of ... just look[ing] at those variables.
>
> [But] it ends up that something like that provides people with a very mechanical way of looking at things. It's unfortunate .... I don't think they could have done it differently if they wanted to do something at that level. But it's a problem, because I don't think that survey has led to eye-popping theoretical results; we just have an enormous amount of data. (*Demographic Destinies*, 1991, p. 506)

Judith coauthored three other articles with Kingsley Davis during this period. The first paper represented Judith's first published analysis of the divergence between official statements on US contraceptive practices by the Catholic hierarchy and the attitudes and behaviors of Catholic laity (Davis & Blake 1960). This theme would be picked up repeatedly by Judith in later articles (e.g. Blake 1966, Blake 1984).

The second article (Blake & Davis 1963) outlined a research agenda for social demography that largely operationalized the analytical framework proposed in the 1956 article. Research questions were posed in the areas of population size, migration, marriage and the family, reproduction, labor force, mortality, and population policy.

> [P]opulation trends are the products of human behavior, and human behavior involves motivation....
>
> It would appear then that attitudes and motives are not simply relevant to population study, but essential. They are essential to understanding the causation and possible modification of population trends, as well as to understanding the social and economic consequences of such trends. So long as population is studied apart from the analysis of goals and motives, it is studied inadequately. (Blake & Davis 1963, pp. 24–25)

The third article was a chapter on "Norms, Values and Sanctions" which appeared in REL Faris's *Handbook of Modern Sociology* in 1964. Here the focus was less on social demography per se and more on a review of the pertinent sociological and anthropological literature on the topic. The authors did not, however, recoil from challenging the perspectives of the major sociological lions of the day, including Parsons, Wrong, Dahrendorf, and Mills. While Parsons-bashing was quite prevalent during this period, Davis & Blake's critique of the conflict theorists was perhaps a first. They succinctly suggested that in their eagerness to critique the Parsons school, these writers confused norms with "good" and failed to realize that there are norms which support "bad" as well (Davis & Blake 1964, pp. 466–468).

Using Secondary Data to Address Major Contemporary Policy Questions, 1965–1970

For all practical intents and purposes, the chapter in the Faris *Handbook* represents the last published collaboration between Kingsley Davis and Judith Blake. Starting with a publication in the *Journal of Chronic Diseases* in November 1965, Judith established a format for her articles that was largely followed in all of her research articles until her death, namely, to identify a contemporary population policy issue, review recent political statements and existent research pertinent to the questions raised, and utilize available secondary or national US data sets in examining the questions posed. Her findings frequently, if not always, challenged or contradicted conventional wisdom on the topic in question. From this time until her death she examined American attitudes toward abortion, childlessness, the status of women, federal family planning programs targeted to poor women and teenagers, the only child, and the impact of family size on the quality of children. In "Demographic Science and the Redirection of Population Policy," Judith criticizes the two then-prevalent views that population increase will, on the one hand, decline only in the context of advanced economic and social development and, on the other hand, decline solely in response to targeted education and communication about birth control (e.g. family planning). In this article, she used available data on European countries both to point out that much can be learned from a study of intended, expected, and completed fertility in European and European-frontier countries and to demonstrate that birth rates did *not* uniformly decline in Europe as a result of industrialization and urbanization but, rather, such declines often preceded the industrial revolution in a geographic region.

In this and succeeding articles, Judith repeatedly makes several points: First, that many explanations for population trends—particularly those that depend on a singular explanation—are far too simplistic and often ahistorical in their simplicity. Second, she argues persuasively for the relevance of studying the population experiences of developed nations in order to better understand and apply data to underdeveloped areas of the world. Third, she describes what can be learned from such studies. Fourth, she repeatedly demonstrates how pronatalist American society and institutions remained. And fifth, she sets the groundwork for what would become another series of classic articles in the field: namely, that economic theories provided insufficient explanations for population shifts.

In a series of articles (Blake 1966a,b), Judith repeatedly demonstrated that between 1930 and 1965 Americans had consistently intended to have 3–4 children *regardless of the number they actually had and regardless of the demographic subgroup with which they were affiliated!*

> No major group in the population wants families small enough to bring about a cessation of population growth even if all other groups were to become similar to it. It is thus unrealistic to believe that any major social grouping constitutes a model for the small family ideal in the United States today. (Blake 1967b, p. 204)

While Catholics generally had larger completed families than did non-Catholics, their expectations regarding family size were more similar to those of non-Catholics than to those of the Catholic hierarchy. Contrary to the expectations of economists, family size did not vary directly with income but did vary inversely with education. Contrary to popular thought of the day (US Senate Subcommittee on Foreign Aid Expenditures 1965, National Academy of Science 1965, US Government Printing Office 1968), Judith succinctly demonstrated that there were not 5 million lower class women who were in need of family planning services! Rather there were perhaps 1.6 million women whose actual completed family size exceeded their desired family size (Blake & Das Gupta 1972).

> Why then is it frequently assumed that there is a numerically important fertility "excess" among the grade-school-educated—an "excess" that more adequate birth-control information and distribution could eliminate? In part, this assumption may be due to a definition of "excess" fertility according to the ideals of the highly-educated, or it may reflect the feeling that fertility is excessive when it has

> nuisance value for the society at large. Relatively large families among the grade-school educated exact public costs through welfare payments, special educational requirements, anti-poverty programmes, etc. The question arises, therefore, whether there is any important sub-group among the lower-educated that does reproduce significantly in excess of its ideals ... It is clear that the range of variation in family size within the grade-school group is far greater than the difference between this group as a whole and any other educational level. Those having no education and one to four years of grade school typically have families close to five children on the average .... [Available data suggest that some number of these women have more children than they desire.] Thus ... it may well be that these women constitute a genuine pocket of fertility excess .... Therefore, although these extremely deprived groups doubtless create a disproportionate share of social difficulty, they are not numerically significant enough to affect the overall grade-school average even if one allows that they are motivated to reduce their family size by one-half to one child on the average.
>
> We must conclude, therefore, that the prospects for narrowing or reversing the inverse family-size differential by education do not seem auspicious if one is hoping to accomplish this end by influencing the behaviour of a major target group with relatively little education.... (Blake 1967a, pp. 173–174)

This series of articles culminated, at least in part, with what subsequently became a classic article, "Are Babies Consumer Durables? A Critique of the Economic Theory of Reproductive Motivation," where Judith concluded:

> Becker's neglect of the social context of reproduction is most evident in four features of his analysis: the analogy of children with consumer durables; the concentration on the "consuming" as against the "producing" role of parents with respect to children; the misapprehension of child costs; and the failure to analyze the utilities involved in having children. (Blake 1968, p. 15)

Ron Lee describes the impact and importance of the article:

> [L]ike her teaching, her research was very forceful, very active, penetrating, masterful. Just as the hour went by in no time at all when you were sitting in her class, so when you read an article of hers, well, it's a very good read, it pulls you along. I remember in particular one article she wrote while I was a graduate student at Berkeley. It was an indignant reaction to work just beginning to be done in the economics of fertility, a paper by Gary Becker.... that article was very critical, in some ways a devastating attack on that approach. But I recently used this article again in a class—some 20 years since it was published—and I realized as I re-read it that, in fact, in her critique she had sketched out much of the research agenda that economic demographers and economists working on fertility followed in the last twenty years. Many of the things she discussed, like putting biology and sociology back into fertility theory and that babies couldn't be purchased at the market have been accepted and studied. It was a very seminal piece and also very lively. (Ron Lee, *Memorial Service for Judith Blake,* June 6, 1993)

Attitudes Toward Abortion, 1970–1980

Judith's interest in understanding institutionalized pronatalist population policy and what differentiated persons who had large families from those who had small ones in combination with the ferment resulting from the advent of the birth control pill and Roe vs. Wade resulted in Judith's taking a hard look at the American citizenry's attitudes toward abortion and the extent to which the perceptions of national "opinion leaders" failed to reflect those of the general population. The result was a series of articles during the 1970s (Blake 1969, 1971a,b, Blake 1972a, 1977a, 1979) that culminated in the realization that fundamentalist religious groups would ultimately mount a substantial backlash to Roe vs. Wade. Judith's early training at Columbia in survey research and questionnaire design was a pivotal part of the methodological expertise that she brought to bear on this topic during this period.

> In Western countries as well as elsewhere the history of population policy has, with few exceptions, been a chronicle of government efforts to repress birth limitations and reward reproduction.... In most of the United States, state laws on abortion constitute some of the more repressive of our pronatalist policies .... What are the chances of fundamental changes in state laws to remove the legal ban on most kinds of abortion? ...
>
> To answer these questions, I shall analyze the differences and changes in views on abortion among white Americans during the past decade. (Blake 1971a, p. 540)

Judith quickly found an answer to the question she posed.

> Our examination in this article of the opinions of various groups in the population on the legalization of abortion contradicts the conclusions usually drawn by those who argue on a priori ideological grounds that certain groups *should* support legalized abortion in the United States. According to the latter, abortion should be supported most strongly by the less advantaged and by women. Clearly this is not the case. Legalized abortion is supported most strongly by the non-Catholic, male, well-educated "establishment." I have explained this finding in terms of the occupational and familial roles that such men play, in contrast with the roles performed by women in their own class, and by men and women in classes beneath them.
>
> We may conclude, therefore, that changes in abortion laws, like most social changes, will not come about by agitation at the grass roots level, or by the activity of righteously indignant individuals who cannot currently circumvent existing statutes. Rather, it is to the educated and influential that we must look for effecting rapid legislative change in spite of conservative opinions among important subgroups such as the lower classes and women.... (Blake 1971a, p. 548)

In 1971, Judith felt that a powerful elitist minority would be able to effect change in abortion policy at the national level in spite of the fact that 80% of the population disapproved of elective abortion, but by 1973 she was already beginning to sense that a backlash was inevitable. She based much of her reasoning on the realization that much of the rationale for believing that the American populace was in favor of abortion was based on answers to a single question commissioned as part of a Gallup Poll by Planned Parenthood:

> As you may have heard, in the last few years a number of states have liberalized their abortion laws. To what extent do you agree or disagree with the following

> statement regarding abortion: The decision to have an abortion should be made solely by a woman and her doctor.

Judith argued that both the wording of the question and its existence as a single question resulted in biased data that failed to tap the full range of attitudes toward abortion (see Blake 1973). To demonstrate her point, she inserted a different question in the August 1972 Gallup survey: "Do you think it should be lawful for a woman to be able to get an abortion without her husband's consent?" Whereas 64% of the Gallup sample answered the first question affirmatively in June 1972, 67% answered the second question negatively. In September 1972, Judith inserted a second question: "Do you believe that there should be no legal restraints on getting an abortion—that is, if a woman wants one she need only consult her doctor, or do you believe that the law should specify what kinds of circumstances justify abortion?" Only 39% of the sample responded that there should be no legal restraints on abortion—quite a drop from the 67% cited by Pomeroy & Landman (1972)!

By 1976 Judith demonstrated that almost half the population favored a constitutional amendment that would prohibit abortions except when a pregnant woman's life was in danger (Blake 1977a) and warned that "If decisions (to legalize abortion] are to be fully implemented on a continuous basis, local organized efforts at collateral deterrence obviously will require equally organized vigilance by those favoring the Court's decisions" (Blake 1977b, p. 53). Judith published her last two papers on abortion in 1980 and 1981 (Blake & Del Pinal 1980a, 1981), leaving the area largely disenchanted. "I quit working on it, because I saw such disaster ahead and I didn't want to predict it anymore. I didn't want to be the person who was saying disaster is coming down the pike, because my pro-abortion predilection was obvious. I felt so overwhelmed by what I saw coming" (*Demographic Destinies*, p. 508).

The Pronatalist Stance of American Institutions and Policy, 1960–1993

Judith's appreciation of the extent to which American society was pronatalist and her ability to verbalize this societal attitude succinctly and pointedly expanded throughout the 1960s and 1970s. Unlike most other sociologists of the period, Judith was not afraid to challenge publicly some of the politically correct sacred cows of the period. One of the particular ironies that she recognized was the essentially pronatalist position of the women's movement. As only Judith could, she succinctly noted in an article on the population crisis

> In all of our deliberations it is most important to remember that people do not have birthrates. They have children.... Individuals' willingness to bear children, to expend their human and material resources creating families, cannot be taken for granted. Rather childbearing and child rearing take place in an institutional

> context that strongly influences people to do one set of things, reproduce, and not to do another set, activities that compete or conflict with reproduction ...
>
> Perhaps most anachronistic is the pronatalism of our current women's liberation movement. It is often assumed that the present-day women's liberation movement is essentially antinatalist in ideology, and that its effect will be antinatalist as well. Actually, however, the main thrust of the movement is supportive of motherhood for all. [Instead] what is decried is the relative disadvantage that women experience because of childbearing and child rearing. In effect, women's liberation is concerned with lowering the exclusionary barriers for women in the labor force, opening up educational channels, elevating women's awareness of subtle forms of discrimination against them in the outside world, and supporting women's rights to have families as well. Rather than concerning itself with the atypical spinster or childless woman, the movement has gained popularity and a constituency through its recognition of the problems of women who have already made the choice to be mothers, and who are dissatisfied with their impaired occupational chances, or find motherhood less than they expected it to be and wish to switch gears .... Consequently, far from questioning the basic premise that all women should be mothers or, for that matter, that all men should be fathers, the women's liberation movement sets the goal of reproduction for all as a basic good. Childlessness is regarded as an inherent deprivation for all, rather than a socially induced deprivation for some.... [T]he women's liberation movement parts company with antinatalists by failing to recognize that it is not in society's interest to encourage the emergence of a family form in which neither parent is committed to parenthood.... (Blake 1972a, pp. 60, 65–66).

As part of a chapter in Parke & Westoff (Blake 1972b), Judith further developed this theme.

> I believe it can be shown not only that there is, in American society, an absence of legitimate alternatives to sex roles having parenthood as a primacy focus, but that change is particularly difficult to effect because those individuals who might aspire to such alternatives are suppressed and neutralized. My thesis is that unless we realize that we have been locking pronatalism into both the structure of society and the structure of personality, the problem of fertility control will appear to be the reverse of what it actually is. We will continue to believe that our principal policy problem is one of instituting anti-natalist coercions instead of lifting pronatalist ones. We will see fertility reduction as involving more regimentation than presently exists, when, in fact, it should involve less, since individuals will no longer be universally constrained to forsake other possible interests and goals in order to devote themselves to the reproductive function. (Blake 1972b, p. 86).

Effects of Sibsize on Achievement and Personality

Although it was often assumed, and Judith herself occasionally suggested, that her interest in the one-child family evolved out of the fact that she herself had a single biological child, in fact Judith's interest in the effect of sibsize on adult achievement and personality was a natural progression from her interest in attempting to understand what motivated people to have children at all and what predicted the number of children desired and had. Whereas her research during the 1960s treated desired, expected, and actual family size as dependent variables, her research during the last fifteen years of her life examined family size as an independent variable or mediating variable between various socio-demographic characteristics of people and the characteristics of individuals. According to Jean van der Tak's interview with Judith:

> [My] interest in the influence of family size on achievement was actually motivated much more by an interest in the effects of high fertility. And other people have just been so interested in the only child that this is all that I can ever somehow get anybody to ask the questions about .... (*Demographic Destinies,* 1991, p. 509).

An article published in the *Journal of Marriage and the Family* in 1979 provides the first evidence that Judith was turning her attention to the no-child and one-child families.

> As a proponent of the thesis that raising the costs of children, including opportunity costs, will lower fertility, I would join in the expectation that augmented labor-force participation [by women] will have this effect .... This investigation was conducted... to determine whether or not children are, indeed, regarded as *social investment goods* in American society, and whether or not people believe that other types of *consumption goods* are more attractive than children.... There is a high level of consensus that nonparenthood is not an advantaged status and, although offspring are not regarded as economic investments, they are viewed as being socially instrumental—not solely as consumption goods. (Blake 1979, pp. 246, 247, 255)

In describing the research of Blake & Del Pinal (1980a,) Hendershot & Placek (1980) noted that:

> ... [T]he major perceived costs of children are the direct costs of parents' time, money, and effort; the major perceived benefits of children are as a social investment—giving their parents a more recognized and secure social role—and the intrinsic rewards of interacting directly with children. Although nonparents saw fewer benefits and more costs than parents, they did not give strong support to childlessness—a majority of nonparents thought the benefits of children were equal to or greater than their costs. Thus, even to the limited extent that it exists in America today, the preference for childlessness does not appear rooted in strong antinatalist sentiment. (Hendershot & Placek 1980, p. 235)

Blake & Del Pinal conclude that "... people are most likely to see reproduction as being socially instrumental when their alternative means for achieving social goals are the most limited. (Blake & Del Pinal 1980b, p. 249)

Starting in 1985, Judith's research focused almost exclusively on the effects of sibsize, with the various analyses reported in articles providing the background and preliminary work for what eventually became only her second book, *Family Size and Achievement* (1989b) or its sequelae (Blake 1981a, 1985, 1986, 1989a, 1991).

Judith's first research in this area built on the work of William Sewell and colleagues, focusing in specific on how sibsize mediated the effect that father's education had on son's schooling (Blake 1985, 1986). Using a series of national data sets, she went on to expand her analyses to look at variables such as verbal and cognitive ability, at socio-demographically described subgroups, and at women. In all instances, Judith found that children from small families fared better on all measures considered. The single consistently occurring confounding variable was the fact that children with no siblings had a higher likelihood that their parents would divorce, and the experience of being raised in such a family tended to offset the relative advantage of being a single child.

Judith's last research, which postdated *Family Size and Achievement*, conducted under grants from the National Science Foundation and the National Institute of Mental Health, examined how sibsize influenced personality characteristics. Contrary to conventional expectations Judith found that:

> ... [The] number of siblings is not strongly related to sociability even among men, and it is not at all related among women.... The definitions of need for affiliation and sociability ... embody extremely attractive characteristics, among them warmth, love, cooperation, friendliness, and reciprocity. We would all like to know what makes people sociable. Except for gender effects, we may never find out, but at least there is some value in knowing that lack of sociability does not appear to be the price exacted for the intellectual advantages of small families. (Blake et al 1991, p. 280)

Although it is technically incorrect to consider *Family Size and Achievement* the culmination of Judith's career as a researcher, many of the questions addressed were originally expressed in earlier articles. Certainly the book's themes continued to express Judith's concern with what she perceived to be a strongly pronatalist society in which successful realization of zero population growth would be far more complex and difficult than originally thought. Whether it be abortion or the institutionalization of small or no-child families, these analyses and Judith's presentation of these analyses continued to point out that child-bearing decisions are made within a web of familial relationships and motivations within a societal and institutional culture. The ramifications of these decisions have relevance for both the individual and the society.

Family Size and Achievement was awarded the William J. Goode Award by the American Sociological Association in 1990.

CAREER POSITIONS

Despite her extensive early research accomplishments, like many women of her generation, Judith Blake experienced the nepotism common to academic institutions when she first moved to Berkeley in 1955. Because her then-husband, Kingsley Davis, was on the faculty of the University of California, Berkeley, Judith took a series of positions as Lecturer, first for the School of

Nursing at the University of California, San Francisco (1957–1959) and later for the Departments of Sociology (1957) and Speech (1961–1962) at UC Berkeley. Judith herself described this period of her life in her interview with Jean van der Tak.

> It changed my life a lot to move to Berkeley.... [I] went into a situation at Berkeley that was very alien for me ... not only because it was sort of a suburb [of San Francisco], but the university itself was ... very chauvinist[ic]; there were practically no women on the faculty and one had the feeling that they didn't want any either.... The chairman of the political science department said that a woman would never get a job on his faculty as long as he was chair. People didn't mind saying things like that. [I] felt [I was] totally out of the scholarly community, because I was no longer a student ... and I wasn't anything else ....
>
> I felt it was to my advantage to take lectureships wherever I could so I could get teaching experience and say I had some teaching. I didn't want this long hiatus to develop in my career while I was doing nothing but writing my dissertation. I was very worried about that. I had to have faith that there was going to be a future, which took a lot of faith in the 1950s, because it was not the time when women were doing this sort of thing. I kept saying to myself, "Just take it a step at a time and if somebody offers you a lectureship or this or that, take it. Then take the next step." It wasn't one of these things where you felt, "There's a career out here for me somewhere." You just felt you were going to have to see how it worked out and hope that things would improve.
>
> That's not such a bad philosophy, actually, because life is incremental and I took those jobs and got some experience. I'm sure I was dreadful to begin with and those poor nurses [at the School of Nursing, University of California at San Francisco] probably suffered through quite a few years of boring teaching. But I would have had to do that somewhere. They seemed very appreciative, though. So anytime I got a chance to do something like this I took it, and I gradually got to be, I think, probably a much better lecturer. (*Demographic Destinies*, 1991, pp. 500–501)

Graduate Program in Demography

In 1962 Judith was appointed as an Acting Assistant Professor of Demography in the University of California at Berkeley's School of Public Health, where she quickly advanced to the rank of Professor. A condition of her initial appointment was to develop a program in demography, and in 1965 Judith became the founding Chair of the Group in Demography and a Professor in the subsequently formed Department of Demography, the first such department in the United States. Between 1967 and 1971, a substantial number of the demographers currently working in the United States and abroad were trained in the Department, largely through Judith's efforts. The Department was unable to survive the student uprisings of the early 1970s but was re-established in the late 1970s. Judith described this period in her interview with Jean van der Tak.

> ...Jacob Yerushalmy in the School of Public Health was very interested in demography. He felt that something should be done at Berkeley in demography. So

he talked to Kingsley about it and then they talked to me about it. I thought that was fantastic. Again, I figured you take it one step at a time. Yerushalmy gave me a job and it was to try to start a group, which was the vehicle that Berkeley had at the time for establishing academic programs. The idea was that you would bring people together from all kinds of departments who had genuine jobs in those departments but who were interested in a sub-field like this one and they would form a group and put a curriculum together and get a degree program started. So that eventually was what I started working on.

We got [the Group in Demography] established [in 1965] and then it was clear that we didn't have any say over people's time or anything. I mean, we were accepting [graduate] students, but you get students and then all of sudden you realize that when people want to go on sabbatical or something like that, they just go and you're not able to say, "Well, this is not a convenient time for us this year. We're accepting x number of students, something has to be done with them, there have to be courses." ... So it wasn't long before it was clear that this was going to be an economically non-viable situation. And it was pretty scary because we had students on deck but you couldn't see faculty on deck, at least on a continuous basis. So we went to [Chancellor] Roger Heyns and he said, "Well, there's really nothing else you can do but form a department." ...

So the department got established [in 1967] ... with three faculty positions and never had more. I was sort of beating the bushes, raising money, all the time .... I could keep it patched together on ... [extramural) money, but it was wild, because we kept getting all these students, large numbers of students, and with the doctoral program we had to keep trying to gin up these courses for them to take, people to supervise their dissertations, and one thing and another ....[W]e started an undergraduate set of courses.... They were very popular. This was the time 1965 to 70, of enormous concern for population and younger kids were all excited about this, so you'd have as many as 200 students in an undergraduate course. It was incredible. We even had an undergraduate major that we graduated some people in.

So it looked as if it was going to be a success—in part, I think, because of the great concern for population in the United States.

But, in time, there was an awful lot of political activity on the Berkeley campus, and by the 1970 cohort, I guess, we had many students who were not only interested in population but were very political. They were very concerned about Vietnam—rightly so, of course. We became—it was a very little, obviously not very strong department—we became a big focal point for this activity.... and part of my problem was that I really felt that all one should be concerned about was demography in the university—I mean, that we shouldn't be political. This itself, I think, probably was a very political thing, in the sense of saying, "Well, I don't think a department should go political." But people who thought it should be political felt that I was being very difficult about this ....

Roger Heyns, who had been very supportive of us, left and Bowker came in as the new chancellor and he was importuned very strongly by the students .... So Bowker's feeling was, "Well, here's a set of faculty positions that I can get hold of and I have no commitment to demography; this wasn't my idea to create a department of demography." ... Meanwhile ... people left and really made it possible [for Bowker to close the department.] .... And Kingsley and I were left with a whole big bunch of students to see through dissertations. ... So I went through a period—and Kingsley went through a period—of getting these people

> through their dissertations and out into the world. Which was a very strenuous period, and was, I felt, a very difficult way of going about things.... (*Demographic Destinies*, 1991, p. 501–502)

Judith described her view of what a department of demography should look like in an article in *Demography* in 1964 where she argued that demography "like other scientific disciplines... has an internal dynamic.... [Its] scope is influenced by the changing (in this case, growing) significance of its subject-matter for world affairs and by the augmented applicability of demographic knowledge and techniques.... As an essentially quantitative discipline, the study of population involves application of mathematics, probability theory and statistics... [with] important connections [to] biology, economics, geography, history, mathematics, statistics [and] sociology" (Blake 1964, p. 258). Judith felt strongly that it was restrictive for demography programs to be housed in other departments, including departments of sociology.

> [O]ver the years, there have been ... groups [that] incorporated... usually about three [different disciplines]. I think it would be a good idea to have that kind of fermentation, because the field I don't think has ever really seen its whole development, especially along biological lines and lines of that sort. It's been very heavily a social science field. I think it would be a very good thing for the field to have more input from, for example .... the sociobiologists, who are out there doing their thing, which in some ways is very demographic .... [There is a] whole group of people who really would benefit—and *we* would benefit—from interaction. Now, I don't agree with them, but that's irrelevant. What's relevant is that they're really thinking very demographically, and it's almost as if they don't know it.
>
> I think the field of demography is very broad. I never agreed at all with Keyfitz' notion that it was just a kind of simple-minded mathematics or something—something that was pretty low-level. I have always felt that it was a field that impinged upon so many areas and that one could, if one could ever realize this in training, have people who brought a demographic perspective to a lot of other fields, which would make people realize what a vital and fascinating perspective this is. I think this may yet happen as time goes by, because we're getting a lot more demographers—a lot of them trained by Berkeley, I'll have to say. We trained an *incredible* number of people in the amount of time we were there. (*Demographic Destinies*, 1991, p. 504)

In the early 1960s, when Judith both outlined and operationalized her ideas about what a program in demography should include and where it should be housed, there were no departments of demography and only the Universities of Chicago and Pennsylvania had a formal concentration in demography. Ron Lee describes what the program at Berkeley looked like from a student's perspective:

> Back in the early 1960s, Judith singlehandedly created the program in demography at Berkeley. She invented it, she gave it a structure, she got outside funding for it, she directed it and led the program, and she taught in it. Perhaps it was the

> first degree-granting program in demography in the country, certainly it was one of the very few, early programs. And over the years when she was there, it produced a very large generation of demographers contributing to society in many different ways .... I was a student there and I remember how the atmosphere in the program was charged with excitement, and crackling high spirits. There was a constant flow of visitors from throughout the United States and abroad giving seminars. The seminars were very lively affairs. (Ronald Lee, *Memorial Service for Judith Blake,* 1993)

Tom Espenshade went to Berkeley as a post-doc in August of 1970. He reminisces about his experiences at Berkeley under Judith's guidance.

> I remember the first time I met Judith Blake. I was totally unprepared for the experience. Sam Preston, who was an Assistant Professor at the time in the Department of Demography, offered to introduce me to Judith, whose office was at the end of a long corridor in one of the temporary buildings on the Berkeley campus. As Sam and I walked down that corridor, I formed a mental picture of Judith. I had just come from graduate school at Princeton, and Judith Blake was already a legend. Her name was everywhere. My memory took me back to the days when I was a junior in college at the London School of Economics. One afternoon I heard a lecture from the distinguished British economist Joan Robinson. When Professor Robinson was introduced, what I saw was a woman in her late 60s or early 70s, plainly dressed in high black tie shoes, and white hair pulled back tightly into a bun. This, I thought, is what Judith Blake probably looked like as well. Sam Preston knocked on the last door on the left at the end of the corridor in building T-8, and when Judith opened it, I practically dislocated my jaw. The person standing in front of me was definitely not Joan Robinson, but rather a strikingly attractive woman in her early 40s, dressed in the latest fashion, with flaming reddish-blond hair, not a strand of which was out of place. That's when I learned to expect the unexpected from Judith Blake!
>
> Judith gave me my first genuine teaching opportunity. It was during the spring semester of 1972 when I was asked to teach baby demography (Demography 100) at Berkeley. It was a wild experience, let me say. There were more than 100 students in the class, some of whom would bring their favorite pets to lecture, others of whom would sit in the back row and read the newspaper. One afternoon in the middle of class, three or four interlopers burst into the room and started pleading with my students to empty out into Sproul Plaza for some demonstration or other. Much to the students' credit (and I suppose partly to mine) the intruders were chased away with cries of "we're here to learn." Teaching that class proved to be a happy experience, and also a productive one because it produced at least two demographers—Greg Spencer and John McHenry.
>
> Judith also gave me my first opportunity to present a paper at a professional meeting. It was the annual meetings of the Population Association of American held in either Montreal or Toronto in the spring of 1972. At the time, I was doing research on the cost of raising children, hadn't quite completed my dissertation, and was petrified at the prospect of delivering a paper in front of a large audience. I prepared solidly for three weeks, going over and over that talk. To this day, I can remember the opening line. The talk was very well received, and the positive feedback that Judith gave provided a big boost to my confidence. (Tom Espenshade, *Memorial Service for Judith Blake,* 1993)

Fred N. Bixby Chair, University of California, Los Angeles

Upon the Department of Demography's closure, Judith moved to the Graduate School of Public Policy at Berkeley, and in 1976 she went to the University of California, Los Angeles (UCLA), School of Public Health as the Fred N. Bixby Chair in Population Policy, with a joint appointment in Sociology. As the first holder of the Fred N. Bixby Chair in Population Policy, Judith Blake was among the first, if not the first woman to hold an endowed Chair in the the University of California system and certainly on the Los Angeles campus. At UCLA Judith took responsibility for developing a Doctor of Public Health (DrPH) program in population and family health. Until shortly before her retirement she chaired the doctoral admissions committee and supervised the doctoral roundtable. In this capacity she served as the primary mentor to the more than twenty doctoral students who started or completed the program during the 15 years she was on the faculty. She developed courses in population policy that were among the most rigorous and highly regarded of those available to students, many of whom sought her out during office hours for both academic and personal advice.

My own memories of Judith date from this period:

> As a student under Kurt Back and Hal Winsborough, I was first introduced to Judith's early work when I was a graduate student, with particular emphasis on her research in Jamaica. However, since I did not pursue demography as an area of concentration, I never saw Judith in action until the Population Association meeting in Seattle in 1975. There, on the first evening of the meeting, I was in the hotel lobby when a group, possibly organized by Linda Moulton, with Judith in the vanguard, sailed into the lobby. I remember asking someone in the area who that was, and being told that it was Judith Blake. Later, during these same meetings, I attended a session for which Judith was the discussant. The session was held in the ballroom, and unlike many such sessions, attracted a large audience. The three presenters gave their papers which, as I recall, were in three quite different substantive areas. Judith then got up as discussant. She carefully examined each paper, using its own basic paradigm and assumptions. She suggested how the analysis might be extended, pointed out flaws in the logic underlying the study, examined the implications for policy and practice, and demonstrated how the papers complemented and contradicted each other. I went away mightily impressed. Judith Blake became my role model for being a discussant. It never occurred to me that she would become a colleague in the not-too-distant future.
>
> When the Bixby foundation provided the School of Public Health with funds for an endowed chair, the late Leo Reeder was appointed to chair the search committee. As an assistant professor, I was not directly involved in the search. But I was, by accident, present when Judith's name was first suggested as a candidate. A group of us were in Leo's suite, and he was suggesting names of people who might be qualified for, and interested in, the Bixby Chair. Someone, possibly Leo himself, suggested the name of Kingsley Davis. Immediately, Leo said, "Well, why Kingsley? Why not Judith?" He immediately picked up the phone and called Berkeley. I don't remember if he actually talked to Judith at the

> time, or left a message. But that was, I believe, the time and the way that Judith's name was entered into the search process. (Linda Bourque, *Memorial Service for Judith Blake,* June 6, 1994)

Judith's own memories of her appointment to the Bixby Chair were recorded in her interview with Jean van der Tak.

> [I went over to the Graduate School of Public Policy at Berkeley] which turned into ... a five-year period which was a very happy one .... [I]t was my first really friendly, supportive environment in academic life ... .[T]hen around 1976, the School of Public Health ... at UCLA got an endowment fund in population which was for a chair and they approached me. And it really didn't occur to me—I think I gave them six people's names, or something, and said these people would be good and that was it. I never thought about it.
>
> Sometime in that period, Leo Reeder, who was a professor in the School of Public Health, called me ... and said, "Why are you not interested in this job." And I said, "Gee, I don't know." I never felt I had to account for why I wasn't interested in the job; it never occurred to me to leave Berkeley. I said, "I'm very happy where I am now." I just hadn't thought of moving. So he said, "It's a very advantaged situation. The faculty position is paid for out of state funds and the chair is just available to you as a yearly income to do research if you wish. This is a nice situation here. You should at least look into it. Why are you so rigid about this?"
>
> So I began to say to myself, "Why am I so rigid about this?" So I [went to Los Angeles] and a great many of my Northern California prejudices were dissipated quite rapidly .... I found the Los Angeles area very attractive. Partly, I was a New Yorker and the proximity to this very interesting city, which was culturally sort of just bursting out all over, and the proximity to the open spaces, like the beach—40 miles of beach .... I was very impressed [with the university] as being in some ways in social and biological sciences a much more dynamic kind of place, a more interesting place to me, than Berkeley. And I felt less political, which was very appealing to me ....
>
> So I began to see it in a different light and we began negotiations. Part of what I think appealed to me is that they were interested in population, whereas where I was, although they were interested in me and were interested a little bit in population, it was really sort of a concession ... having me in the School of Public Policy; population had never been one of the big things that they were interested in .... I guess I hadn't realized until I left [Berkeley], but it was almost as if something had stopped drilling and I suddenly realized, "There are other things and other places." ... So we negotiated a job here and I got a very substantial promotion and the chair and one thing and another.... So it has been a very happy situation for me. (*Demographic Destinies,* 1991, pp. 502–503)

Professional Service

Judith served on numerous university and professional committees and boards. She was elected President of the Population Association of America (PAA) in 1981, and at the time of her death was the Editor of the *Annual Review of Sociology.* The 1981 PAA meeting was the fiftieth anniversary of the Association, and Judith organized a program that featured many of the important demographers of the twentieth century.

> We wanted to have this be a real 50th anniversary, with people who younger people might not see again in a long time for a variety of reasons .... It was ... our way of saying thank you to them and making them feel that we appreciated all the things that they've done over the years .... It was ... a recognition of our forebears in the field. There was a lot of enthusiasm ... for doing it. It brought people ... together and the committee was full of beans about this and very helpful.
>
> But it's an awful job, because, fundamentally, as you get down to the wire, you get to be the central nervous system for it. You can never delegate completely; ultimately, it's all got to come together. And as you get down to that point, it's murder—it really is. (*Demographic Destinies,* 1991, p. 516)

Judith chose to focus her presidential address on emerging research rather than summing up a trend of past research. The topic of her address "Family Size and the Quality of Children" became the basis of her book *Family Size and Achievement* (1981b, 1989b).

> Some people gave presidential addresses which were very appealing and fun. But I felt that if it was the 50th anniversary, it shouldn't be something that was just topical or light-hearted. I felt it should be something that was serious, or was research, or whatever. And I had been thinking about this for long time, in part because it stemmed from all the arguments—with the Julian Simon argument—about population growth. I had been thinking how one could zero in on this in a way that would be more definitive.
>
> I started working on this material and realized that it could be quite interesting. I thought, "Well, I am not going to stop this now in mid-stream and start on something else, and what would the something else be?" I didn't want to talk about abortion, because I didn't want it to be controversial that way; I didn't want it to be inflammatory. So this was the logical thing. It was also practical: I was working on it and I just couldn't switch horses at that point. (*Demographic Destinies,* 1991, p. 514)

TEACHING

When Jean van der Tak asked Judith, "What accomplishments in your career have given you the most satisfaction?" Judith responded, "Oh, gosh, I don't know. I've gotten a lot of satisfaction out of teaching. I've greatly enjoyed teaching."

Jean went on to say:

> Everybody I know who's studied with you thinks you're a dynamo. That was one expression that John Weeks used when we were talking about you at the recent PAA meeting. Alex von Cube, a good friend of mine at the Population Reference Bureau, said your classes were so stimulating, that occasionally there was controversy, lots of controversy. He said you could be hard on people, and sometimes you were a bit conservative, some of your students felt. (*Demographic Destinies,* 1991, p. 510)

At the memorial service for Judith Blake on June 6, 1993, Ron Lee, Tom Espenshade and Jennifer Frost all commented on Judith's teaching. Ron Lee stated:

> I came to Berkeley as a graduate student in 1965. I'd been an undergraduate major in philosophy. I didn't really know much about what demography was about. I had a lot of reservations about entering a very new and a seemingly very strange program. I went into the first class, which was taught by Judith. The classroom was filled with tables as well as chairs. Every table had one of those massive old calculators, not little electronic things the size of credit cards like we have today; these were big! I thought, "God, I want to hear about ideas, theories; I don't want to do calculations," and so my concerns about demography as a field grew more intense. But then Judith started talking and teaching, and it was only a few minutes before I realized that I was in for a real intellectual treat. Judith's classes weren't really about numbers, they were about ideas and theories. The numbers were all entwined with the ideas, in supporting roles. And so Judith's teachings, as I said, really were about ideas and theories. Classes were intellectual, very rich. The theories and ideas for her were not like books on a shelf or like cans in a supermarket, sitting there in their positions. She didn't offer them to us like a grocer or a librarian, but instead her theories were very vivid, forceful things that were engaged in their own struggles, they had lives of their own. And her role as the teacher and our role as the students was not just to watch this struggle of ideas from the sidelines, but rather to get down there in the pit and argue about them and take part in this intellectual combat that was going on, with Judith leading us through. Well this was a very exciting way to teach .... Certainly, she was the best teacher I ever had, in my graduate or undergraduate years, the most exciting, the most stimulating, and in many ways the deepest. (Ronald Lee, *Memorial Service for Judith Blake*, 1993)

Tom Espenshade commented on Judith's role as a teacher in professional settings outside the classroom.

> An unexpected aspect of Judith Blake was that she had an Assistant Professor's outlook in a Full Professor's body, and by that I mean that she was always prepared; Judith didn't leave anything to chance. The first time I noticed this occurred sometime in the 1970s when my family and I were living in Tallahassee, Florida. Judith had been asked by the population center at Florida State University to come down and give a talk. Because we had known each other at Berkeley I invited her to stay with us. Early in the morning before the sun was even up, I walked past Judith's room and noticed the light coming out from under the door. Several hours later, over breakfast, I commented on this, and Judith replied that she had gotten up early to prepare her talk. One might have expected seasoned pros to talk off the cuff, but not Judith.
>
> A second example occurred when Judith was asked to be a discussant at the PAA meetings for a paper being presented by Paul Schultz. Schultz is an economist schooled in the latest econometric methods. Judith was not daunted by the task, and set about learning two-stage least squares and simultaneous equations models so she would have something intelligent to say. I was tremendously impressed. Judith never stopped learning, never stopped pushing herself to higher

> and higher levels, and never stopped expecting anything less from those around her. (Tom Espenshade, *Memorial Service for Judith Blake,* 1993)

Jennifer Frost has similar memories of Judith as a classroom teacher and mentor.

> In September 1981, I first walked into Judith Blake's office, a new masters student, assigned an advisor whom I knew relatively little about. Little did I suspect that over the next ten years, that office would become a second home, and the woman, who was so friendly and helpful on that first encounter, would become an inspiration, a mentor, and by far the most influential person in my college years, guiding me by example and by subtle prodding through the maze of academic, professional, and personal decisions which characterize graduate life. In time, as I became somewhat educated in the field of population-related issues, I realized that my teacher was no ordinary professor, but an academic giant, a consummate scholar, a true scientist. My recollections of Judith, like those of many here today, began as a student, and evolved as I came to know, trust, respect, and love this remarkable woman. As a student, I stood in awe of her abilities as a lecturer. If the future should ever find me at the head of a classroom, I know I have an exemplary model from which to draw motivation and guidance. Somehow, even the driest topics took on new meaning in her classroom. She conveyed such a sense of enthusiasm and excitement about the importance of studying population policy, demography, and the sociology of family behavior. Moreover, she taught us to challenge everything. The rhetoric of conservatives and liberals alike often passed before her scientific scrutiny and rarely escaped unscathed. Yet the Judith Blake which I remember most clearly is not the academic scholar or the animated lecturer but the warm, caring human being. A few weeks ago, I was speaking about Judith to one of the editors where I now work at the Alan Guttmacher Institute, and, with real reverence, he declared, "She was a real giant." My response was, "Yes, but even with such distinction she always had the time to give help and support to those of us who studied and worked with her and she always made us feel that our ideas and thoughts were important and worthy of consideration." "That," replied my coworker, "is rare indeed." As a research assistant and an advisee struggling to write a dissertation, I remember both the substantive advice and guidance which Judith dished out, as well as the humor and conversation which characterized her office. Life there was usually a lot of fun, and over the years she gave us encouragement, warmth, and ample suggestions for vacation getaways, movies, and good food. For me, and a relatively high proportion of the female doctoral students under her wing, the discussion invariably turned to the topics of childbearing, child care, and the joys and frustrations of motherhood. Unlike some in the academic world, Judith was also rare in her unequivocal support for those of us who chose to combine graduate studies with childbearing. "For a professional, career-minded young woman, there is no 'good' time to have a baby," she would say, "so one must just make the best of things as they occur." During the early stages of my dissertation, I also remember being impressed by her seemingly insatiable curiosity about the world and all the variety of people in it. When I chose to study culture and fertility in Kerala, she was undaunted. She requested that I provide her with a few references covering Kerala's history, culture, and social structure, and soon she was well versed in the peculiarities of that region, debating with me the relative importance of

corruption in the corporate matrilineal joint-family versus economic change as a stimulus to fertility change. As my research progressed and I began to prepare to orally communicate some of my findings, her advice over and over again was "Rehearse—you can never rehearse too many times." I'm afraid that I never left myself enough time to be as organized, as prepared, as rehearsed, as Judith always seemed to be. But the debt which I owe Judith is somehow deeper and more personal than that of a traditional student-teacher relationship. For some reason she had confidence in me, and her confidence helped me to believe in myself at a time when my own faith was waning. When, unexpectedly, my husband died, leaving me with an unfinished dissertation and an infant son, it would have been quite easy to give up on many of my goals. But Judith was there, providing emotional and financial support, and even without saying anything, I felt her confidence; for her there was no question that I would not only finish, but also excel in all I attempted. At that time, I might have been able to sacrifice my own expectations, but somehow I couldn't let go of the expectations which I knew she held for me. I remember a conversation which I had with Judith some weeks after my husband died, and while most of the words are a blur, one statement stands out in my mind: "Jennifer," she said, "now it's your turn to shine." In June of 1992, a year ago this month, Judith stood next to me and shook my hand as I received my doctorate. It was a shining occasion, and I knew then, as I know today, that much of what I had achieved, and much of what I will achieve, is due largely to the influence of Judith Blake on my life. Her memory will inspire and guide me as I accept new challenges and move on through life. (Jennifer Frost, *Memorial Service for Judith Blake,* 1993)

Judith herself said the following about her teaching:

I've never liked teaching huge amounts, because I like to prepare a lot, and I like to use teaching as a way of picking up on issues that I wouldn't ordinarily be starting to write about or do research on and thinking them through. So I've always used it as that kind of a vehicle, for getting into something that I was just starting to think about. It gave me an opportunity to do a lot of reading, a lot of thinking. It has fed into research—not on a day-to-day basis but more to say, "This is a way of beginning to think about something and get input from people and have them criticize you and get a lot of stuff going on something." It's been very creative for me for this reason, and I've enjoyed it enormously.

Interestingly enough, over the years I've seemed far less conservative to people, partly because they have gotten more conservative, I think. So that is rarely mentioned at this point in time, because people have changed their own views about a lot of things. That helped—not that I changed them, but the world has changed....

[W]hen I was coming along ... [being a woman] was a big disadvantage .... Nobody thought of you as being anybody and nobody ever thought of you for anything. When I looked and saw how young men were sort of mentored and coddled and taken under people's wings and pushed and so forth, I didn't feel that during my youth it was an advantage to be a woman at all, in academic life.

On the other hand, I have tried, I think, to make it an advantage for other women. I've felt very strongly about this. I'm not a rabid feminist in the sense that I've joined groups and things of this sort. But I have been very instrumental in pushing a lot of women along. And increasingly so, as opportunities are arising, I think I have helped a lot of people to get good jobs .... And helped them over

> life-cycle events, like pregnancy, for example, which I think many males have always felt was "She got pregnant; that's the end of that." I have been very supportive of people who have been in this situation and made them feel that there's no reason at all why they can't continue, through their pregnancy, getting their dissertation done. (*Demographic Destinies*, 1991, p. 510)

It is well to note how Judith affected students who did not go on to become demographers. An anonymous student made the following observation in a 1983 teaching evaluation:

> Dr. Blake has provided the most intellectually stimulating challenges in my graduate career. I marvel at the breadth of her knowledge outside demography, from Samuel Johnson to *Le Rouge et le Noire*, absolutely topnotch presentations and rigorous thinking.

CONCLUSION

Judith Blake was a dynamic and creative researcher and teacher who, nonetheless, never underestimated the value of preparation. Whether presenting to a packed ballroom at the annual meetings of the Population Association of America, lecturing to a classroom of first-year masters students, or participating in a department meeting, she was a dramatic speaker and never dull. When Judith was on the program at the Population Association meetings, the sessions were often scheduled for the largest room available. "People jammed the room, standing out in the hall, and Judith would stand up and be sparkling and entertaining and enlightening and penetrating" (Ronald Lee, *Memorial Service for Judith Blake*, 1993).

> Most of you are aware of her many accomplishments, her extensive writings in many areas.... Also, all of you knew the considerable energy and verve which she brought to everything she did. What is less well known, I think, since Judith, was a very private person, is that she achieved all this despite an adult life characterized by many severe illnesses. She had a bout with kidney cancer which started in her late teens, was not diagnosed and dealt with until her mid-20s. And then there was the onset in her late 20s of the serious lung disease from which she eventually succumbed. In fact, she had an episode where I understand the doctors told her that she probably could only expect to live ten more years, and she outdid them by over 30 years. Despite all this, she managed to build up a long and distinguished career, without most people knowing that she was ill until very recently. And in fact many people didn't even know that she was ill until she died. I hope that it's a sign of the tremendous willpower and true energy that she had despite all this. (Valerie Oppenheimer, *Memorial Service for Judith Blake*, 1993)

While Judith had little tolerance for fools, she was neither mean-spirited nor vindictive. She did expect those with whom she interacted to continually question, challenge, and stretch their intellectual abilities in the same way that she did. She loved a good intellectual debate, but when she disagreed it was with the ideas expressed, not with the person who expressed the ideas. The force of her personality drew people to her; many stayed to learn from her, exchange ideas with her, and ultimately, to build upon what she gave them. She is sorely missed by her former colleagues and students, but she has left a strong legacy in her research, the students she taught, and the friends and colleagues she influenced.

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Literature Cited

Blake J. 1955. Family instability and reproductive behavior in Jamaica. *Current Research in Human Fertility*, pp. 24–41. New York: Milbank Memorial Fund

Blake J. 1961. *Family Structure in Jamaica: The Social Context of Reproduction.* New York: Free Press

Blake J. 1964. Issues in the training and recruitment of demographers. *Demography* 1:258–63

Blake J. 1965. Demographic science and the redirection of population policy. *J. Chronic Dis.* 18:1181–200. Reprinted in *Public Health and Population Change*, ed. MC Sheps, JC Riley, pp. 41–69. Pittsburgh, PA: Univ. Pittsburgh Press

Blake J. 1966a. Ideal family size among white Americans: a quarter of a century's evidence. *Demography* 3:154–73

Blake J. 1966b. The Americanization of Catholic reproductive ideals. *Popul. Stud.* 20.27–43

Blake J. 1967a. Reproductive ideals and educational attainment among white Americans, 1943–1960. *Popul. Stud.* 21:159–74

Blake J. 1967b. Income and reproductive motivation. *Popul. Stud.* 21:185–206

Blake J. 1968. Are babies consumer durables? A critique of the economic theory of reproductive motivation. *Popul. Stud.* 22:5–25

Blake J. 1969. Population policy for Americans: Is the government being misled? *Science* 164: 522–29

Blake J. 1971a. Abortion and public opinion: the 1960–1970 decade. *Science* 171:540–49

Blake J. 1971b. Reproductive motivation and population policy. *BioScience* 21:215–20

Blake J. 1972a. Here and beyond—the population crisis: the microfamily and zero population growth. In *Families of the Future*, pp. 55–68. Ames: Iowa State Univ. Press

Blake J. 1972b. Coercive pronatalism and American population policy. In *Aspects of Population Growth Policy. US Commission on Population Growth and the American Future*, ed. R Parke Jr, C Westoff, 6:85–108. Washington, DC: USGPO

Blake J. 1973. Elective abortion and our reluctant citizenry: research on public opinion in the United States. In *Abortion Experience in the United States*, ed. H Osovsky, J Osovsky, pp. 447–67. New York: Harper & Row

Blake J. 1977a The Supreme Court's abortion decisions and public opinion in the United States. *Popul. Dev. Rev.* 3:45–62

Blake J. 1977b. The abortion decisions: judicial review and public opinion. In *Abortion: New Directions for Policy Studies*, ed. E Manier, W Liu, D Solomon, pp. 51–82. Notre Dame, IN: Univ. Notre Dame Press

Blake J. 1979. Is zero preferred? American attitudes toward childlessness in the 1970s. *J. Marriage Fam.* 41:245–57

Blake J. 1981a. The only child in America: prejudice versus performance. *Popul. Dev. Rev.* 7:43–54

Blake J. 1981b. Family size and the quality of children. *Demography* 18:421–42

Blake J. 1984. Catholicism and fertility: on attitudes of young Americans. *Popul. Dev. Rev.* 10:329–40

Blake J. 1985. Number of siblings and educational mobility. *Am. Sociol. Rev.* 50:84–94

Blake J. 1986. Number of siblings, family background and the process of educational attainment. *Soc. Biol.* 33:5–21

Blake J. 1989a. Number of siblings and educational attainment. *Science* 245:32–36

Blake J. 1989b. *Family Size and Achievement.* Berkeley: Univ. Calif. Press

Blake J, Das Gupta P. 1972. The fallacy of the five million women: a re-estimate. *Demography* 9:569–87

Blake J, Davis K. 1963. Population and public opinion—the need for basic research. *Am. Behav. Sci.* 6:24–29

Blake J, Davis K. 1964. Norms, values and sanctions. In *Handbook of Modern Sociology*, ed. REL Faris, pp. 456–84. Chicago: Rand-McNally

Blake J, Del Pinal J. 1980a. Predicting polar attitudes toward abortion in the United States. In *Abortion Parley*, ed. J Burtchaell, pp. 29–56. Kansas City: Andrews & McMeel

Blake J, Del Pinal J. 1980b. The childlessness option: recent American views of nonparenthood. In *Predicting Fertility: Demographic Studies of Birth Expectations*, ed. G Hendershot, P Placek, pp. 235–64. Lexington, MA: Lexington

Blake J, Del Pinal J. 1980c. Introduction to. The childlessness option: recent American views of nonparenthood. In *Predicting Fertility: Demographic Studies of Birth Expectations*, ed. G Hendershot, P Placek, p. 237. Lexington, MA: Lexington

Blake J, Del Pinal J. 1981. Negativism, equivocation, and wobbly assent: public support for the prochoice platform on abortion *Demography* 18:309–20

Blake J, Richardson B, Bhattacharya J. 1991. Number of siblings and sociability. *J. Marriage Fam.* 53:271–83

Bourque LB. 1993. Comments. *Memorial Service for Judith Blake*, June 6

Davis K, Blake J. 1956. Social structure and fertility: an analytic framework. *Econ. Dev. Cult. Change* 4:211–35

Espenshade T. 1993. Comments. *Memorial Service for Judith Blake*, June 6

Foley D, Hertz H, Blake J, Kettler S. 1953. *The Mediterranean Region and Its Cities*. Bur. Appl. Soc. Res., Columbia Univ., New York. Monogr. US Air Force

Frost J. 1993. Comments. *Memorial Service for Judith Blake*, June 6

Lee R. 1993. Comments. *Memorial Service for Judith Blake*, June 6

National Academy of Science. 1965. *National Academy of Science—National Res. Counc. Publ. 1279*

Oppenheimer V. 1993. Comments. *Memorial Service for Judith Blake*, June 6

Pomeroy R, Landman L. 1972. Public opinion trends: elective abortion and birth control services to teenagers. *Fam. Plan. Perspect.* 4:44–55

Stycos J, Blake J. 1954. The Jamaican family life project: some objectives and methods. *Soc. Econ. Stud.* 3:342–49

US GPO. 1968. *Report of the President's Committee on Population and Family Planning: The Transition from Concern to Action, Washington, DC: USGPO*

US Senate Subcommittee on Foreign Aid Expenditures. 1965. *Hearings on S. 1676.* Washington, DC: USGPO

van der Tak J. 1991. Interview with Judith Blake. *Demographic Destinies, Interviews with Presidents and Secretary-Treasurers of the Population Association of America, PAA Oral History Project*, Vol. 1, May. Washington, DC: Pop. Assoc.

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